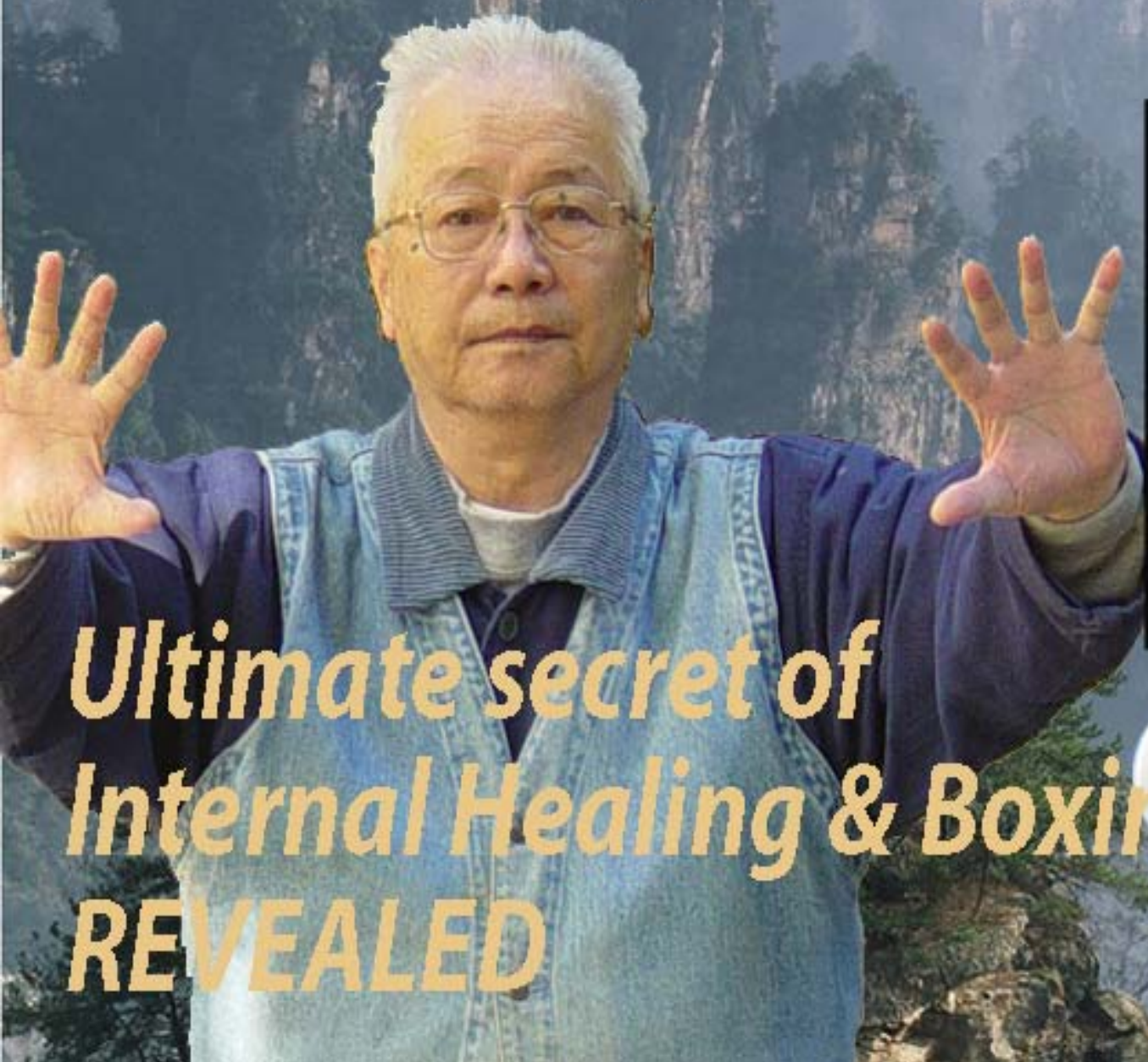


# 大成拳

## ZHAN ZHUANG & THE SEARCH OF WU

By Yu Yong Nian



YIQUAN

*Ultimate secret of  
Internal Healing & Boxing*  
**REVEALED**



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Boxing REVEALED**

# 站桩与求物

*Chinese martial doctrine is intimately related with the mental and self cultivation approach which characterizes the philosophical principles of Chinese martial arts, leading it to always new exciting vast areas of discovery.*

*Chinese martial doctrine is permanently striving for a stronger, more independent and braver spirit.*

*Among the most successful of its adepts will emerge new gifted elite with unpaired strength and mind.*

*Chinese martial doctrine can open to people new ways of problem solving for their health or daily activities.*

*Martial doctrine can also join people of same aspiration to contribute to the progress of the whole humanity through its unorthodox but simple path and already its principles are known for their deepness and refinement, cultivating higher consciousness with profound serenity.*

## About the author



Among the earliest students of Grand Master Wang Xiang Zhai was a young man who studied orthodox Western medicine and then specialized in dentistry. His name was Yu Yong Nian.

Yu Yong Nian was born in 1920, after completing his initial schooling he was sent for specialist medical education in Japan. At 21 he was graduated from the University of Tokyo and returned in China.

From then he started to work for the Beijing Railway General Hospital.

Three years later, exhausted from the long, constant hours of dental practice, he began training under Grand Master Wang Xiang Zhai.

In 1944 Dr. Yu started to learn zhan zhuang and after nine years of training he introduced aspects of Zhan Zhuang as treatment for internal diseases in his hospital. His successes led to a major medical conference in 1950 at the Beijing Capital Number Three Hospital to introduce Zhan Zhuang system to hospitals throughout China.

“When I was training in the park under Master Wang Xiang Zhai,” Doctor Yu later recalled, “he would tell me to *pull the tree towards me and push it back*. This was from a distance and I could not imagine how I could possibly do that! Only after long practice did I begin to feel the connection with the tree. Then I began to understand his words.”

During more than 60 years of practice and exploration, Dr. Yu has constantly done researches on the curative effects of Zhan Zhuang as well as its martial applications.

Today Dr. Yu is considered as the world’s leading authority of Zhan Zhuang Chi Kung and is still continuing his invaluable contribution to the development of Zhan Zhuang and Yiquan.

The invaluable contribution of Dr. Yu in Dachengquan is also expressed in the success and the popularity of his students such as Lam Kam Chuen,

Guo Guizhi...

The first books that Dr. Yu wrote were written in collaboration with Wang Xiang Zhai himself, later Wang empowered Dr. Yu to continue his research on zhan zhuang, at that time Dr. Yu integrated progressively his own touch and approach in his following books.

This book is his fifth book published on Zhan Zhuang and is integrating all the previous four books with the results of his latest research.





## Foreword

In Chinese traditional martial arts where real knowledge was generally secretly preserved in the past, zhan zhuang (post standing) was always the basic technique from which any adept should start, but in the same time instructions were sporadically diffused from mouth to mouth, depending to the personal relationship between master/disciple and his own ability to deepen by himself the few instructions he had gathered.

In the 1920's when I started to study with Master Wang Xiang Zhai., Wang was just coming from the Shen county of Hebei province and he was opening his school to the public.

Then progressively improving my practice, deepening my inner perception of this art and I decided later to develop more specifically the special healing aspects of zhan zhuang.

The methods of Zhan zhuang: Zhuan zhuang techniques taught by Mr. Wang Xiang Zhai, are the basis of Xingyiquan (Body mind boxing), Xinyiquan (Heart body boxing), Yiquan/Dachengquan, in opposition with any traditional “taolu” method (chaining movements or frames) or linking postures and tricks, they are especially focusing on the mental inducement, the spiritual activity, the unification of the will, power, movement, integrating in the whole body all its factors in a same overall activity and leading, as martial circles could testify at that time, to an unusual but highly efficient martial art.

Dachengquan's training method includes zhan zhuang as the main course completed with stepping, testing force, issuing force, testing voice, pushing hand and sparring.

In 1944 I started to learn zhan zhuang with Mr. Wang Xiang Zhai, studying the various posts standing of Yiquan, but especially those which can be used specifically for medical treatment of patients suffering from chronic diseases: these ones are called “Healing posts” (Yangsheng zhuang).

In fact Dachengquan has its very specific points: no frame and or any linking postures, again there is not the target to master a full set of chained movements.

When you start your training of Dachengquan you'll have to assume a same and identical posture, keeping it without any other posture as long



as you can.

In my case I learned only one posture during the first month. Honestly speaking, after this first month, I felt bored and I stopped the training. Then after a certain period I start again to train, hoping to learn new posture, but unfortunately I had to hold again the same previous posture.

After a certain period I stopped to pick up training later again.

This happened several times... Months and even years passed... I realized progressively the huge and almost unlimited potential of zhan zhuang. It appeared to me as an unusual way of physical exercise involving the very deep of internal physiological structure of the body and as a physical training which was based on very tangible principles. Generally in physical exercises, sports and martial arts disciplines, movement is essential, we can even say that each discipline has its special type of movements.

But in Dachengquan's zhan zhuang, we just stand, staying right on the same position, the same place, there is even no displacement from one place to another.

From that point, neophytes raise inevitably doubts about the method itself:

- Without movement, how can it be physical effort? If yes what kind of physical effort?
- Without movement, without taking medicine or any injection, how can you cure yourself?
- Without movement in your training, how can you increase your strength?

We will answer to these questions in the following pages of this book.

Before starting to develop the subject, I would like to thank all those who helped me during all these years in all phases of experimentation, appreciation or validation leading me to write this book.

Again I would not like to present the contents of my research as definite and absolute but rather as emerging axes after years of practice, revealed progressively to me and can serve as trends of development for any serious practitioner of Dachengquan.



## Author notes

Opportunities such as the commemoration of Wang Xiang Zhai's 110 years (1886-1996), the founder of Dachengquan (also called Yiquan), intending to present zhan zhuang and Dachengquan more generally to a larger audience, are definitively too rare, it is for this reason why I decided to share my experience of many years practice in post standing and sparring and condense it in this new book. It was such an honor but in the same time also such a huge task to put in order, revise, actualize and add further comments to Wang's latest unpublished writings such as "Dao of combat", "General training program in martial art" and "My Memories"... but also many others relevant materials which contributed to propel Dachengquan to its top ranking of innovative and effective martial art..





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# I. Introduction

## I.1 Zhan Zhuang applied as medical treatment

Although trees do not move, they keep on growing endlessly, cumulating massiveness and strength during all their life.

This is probably how, inspired by this amazing property of the Nature, in Ancient China, the training method of **Zhan zhuang** (standing pole or standing post) was created at the time where China mostly depending on its agriculture.

Around 2700 years ago, the famous Chinese philosopher 《Guan Zi》 wrote:

*If your upper (body) does not (reflect) any principle,*

*if your lower (body) is not substantial,*

*do not run like a horse,*

*do not fly like a bird.*

*Do not move until (acquiring) the object,*

*observe what it follows,*

*if you move then you will deviate from it,*

*inside calmness you will gain it...*

*(Guan Zi – Volume 13: Xinshu – Chapter 36)*



We will see in the following parts of this book how accurate Guan Zi was already describing Zhan Zhuang training method.

Later another famous philosopher 《Lao Zi》 provides also a very interesting description of **Zhan zhuang**:

*Stand by yourself and hold (your posture),*

*observe the Wonderful...*

*Promote (internal) circulation untiringly,*

*then watch it arouses...*

*(Laozi - Dao De Jing - Chapter 1 and Chapter 25)*

This description of standing method is a very close description of **Zhan zhuang**'s training method.

Later in the Classic TCM reference 《Huang Di Nei Jing》 we can find again some concrete reference and explanation to **Zhan zhuang**:

*Lift and support Heaven and Earth,*

*Grasp Yin and Yang,*

*Breathing deeply air,*

*Stand and meditate profoundly,*

*(All) muscles (unified) as one.*



(《Huang Di Nei Jing》 - Gu Tian Zhen Lun)

So traditionally **Zhan zhuang**'s method had different names such “*Do not move until the object*”, “*Stand by yourself and hold (your posture)*”, “*Stand and meditate profoundly*” ... but all bearing the same and identical method of training.

Today **Zhan zhuang** is not only the basic technique in martial arts but it is also an powerful way of healing used for medical treatment.

According to clinical experimentation and tests, there are many kinds of chronic diseases such as chronic tracheitis, chronic gastroenteritis, chronic hepatitis, cardiopathy, high blood pressure, neurasthenic, chronic rheumatoid arthritis and similar rheumatoid arthritis, but also diseases which may affect severely the appearance of the patient's body such as adipoma, goiter, fingers shivering, etc... may reveal unbelievable beneficial effects after **Zhan zhuang** practice.

The most important characteristic of **Zhan zhuang** as healing method is that there is no side-effect.

There is no side effect because it is not necessary in **Zhan zhuang** to enter absolutely stillness, you don't need neither to control or adjust your breath, it is not also required to keep your attention in the *Dantian* area or conduct your Qi according to the Large or small Heavenly Circulation.

What you need is just a place with good sunshine and fresh air, no matter if it is indoor or outdoor, assume your posture, stand and do not move, like immobilized, breath naturally, your whole body keeps a general state “relaxed but not slack, contracted but not rigid”.

Post standing method includes a large number of postures, but the method in itself is quite easily accessible, and your training time can also be adjusted by yourself, in general practitioners start from 5 minutes and increase it progressively up to one hour.

In fact men, women, senior and junior generations, all can practice **Zhan zhuang** according to their own situation, at any time and any place.



From the medical point of view, human body has its own defense mechanisms to withstand effects external factors or any viral or bacterial agent etc...

The integrated body system of organs, tissues, cells, and cell products such as antibodies that differentiates self from nonself and neutralizes potentially pathogenic organisms or substances is called immune system and constitutes for example a vivid expression of this ability.

But everyone's immune system is different and even for a same person, it may response differently according to the time and place.

But when your immune system is declining all these millions of bacteria, microbes, viruses, toxins, parasites, etc... previously eliminated and contained by it, progressively find their way to harm your body.

Why post standing can cure diseases and build stronger body? It is because through its specific system of training, all the physiological and psychological functions of the body are gaining in adjustment, strength and enhancement.

### *Nourishing your blood*

During Zhan zhuang, your four limbs are maintaining a single posture i.e. angles between them are unchanging, but this requires a constant contracting/relaxing process between muscles and bones, accordingly this will mobilize larger and smaller blood vessels, promoting a better blood circulation in the whole body.

In the same time, muscles are also great benefiting from this higher irrigation. This will mainly be manifested in hands and feet where you will experience tingling and swelling feeling, but also on the skin some sensations such as ants climbing, warmth and sweat etc...

After one hour of Zhan zhuang the composition of your blood may sensibly change:

- up to 1520 000 additional erythrocytes (red blood cells) per cm<sup>3</sup> of blood,





- up to 3650 additional hemoleukocytes (white blood cells) per cm<sup>3</sup> of blood,
- up to 3.2 gram of additional hemoglobin per cm<sup>3</sup> of blood.

### *More Oxygen*

Red blood cells are able to carry oxygen so efficiently because of haemoglobin they contain. In fact, it is the haemoglobin that is responsible for the colour of the red blood cell.

As blood passes through the lungs, the haemoglobin picks up oxygen (up to 97%), because of the increased oxygen pressure in the capillaries of the lungs, and can then release this oxygen to body cells where the oxygen pressure in the tissues is lower. In addition, the red blood cells can pick up the waste product, carbon dioxide, some of which is carried by the haemoglobin (at a different site from where it carries the oxygen), while the rest is dissolved in the plasma.

All this explains how important this increase of hemoglobin can directly impact the quantity of oxygen in your body.

With this additional amount of oxygen brought to your organ systems, you will be in a special state of relaxation and well being.

A further action of this slight stimulation is to promote a much better quality of the cerebral cortex excitation.

In others words this stimulation acts on the highest level of the nervous system and the region most closely associated with thought: the cerebral cortex.

It is precisely the readjustment of this cortex excitement which will support the recovering process.

This is why ***Zhan zhuang*** has particularly good results in treating neurasthenia, arthritis, angina, cirrhosis, cardiovascular diseases, etc...



### *Better nerve excitation*

Headache, sleeplessness and mental fatigue are symptoms of neurasthenia and others chronic diseases currently not easily curable by conventional medicine.

Human sleep seems to have much in common with that of other mammals. It occurs regularly each day, largely under the influence of the 24h circadian rhythm. There is a typical body posture, a specific place to sleep, other behaviors and physical activity cease, the eyes close, and there is a generalized reduction in sensory awareness. The organ showing the clearest changes during sleep compared with relaxed wakefulness, is the brain. This is particularly obvious in the electroencephalogram (EEG), the brains electrical activity. Focusing on the brain in this way is appropriate in other respects, as not only does the brain contain the control mechanisms of sleep, but of all the body's organs, it is the brain and its behavior (especially the cerebral cortex) for which sleep seems to be the most vital.

Human sleep is immediately affected by the quality of cerebral cortex excitation. Insomnia symptoms include migraine, dizziness affecting your daytime functioning, such as difficulty concentrating or irritability... the patient facing all these symptoms can be effectively treated by practicing **Zhan zhuang** exercise.

When he will be able to assume **Zhan zhuang** during 30 to 40 minutes without any interruption, effects will be more obvious: due to the enhancement of blood circulation and the increase of general metabolism in the body, these symptoms of headache, dizziness or general fatigue, will disappear and in the same time he will feel very relaxed in his mental, his chest and will experience an ineffable feeling of comfortable feeling of well being.

We have many cases of patients who were suffering soreness around the head before training, experienced the feeling of having their head very light after their training.

If they can still increase their standing training session than the



curative effects will go even more deeply, working on the roots of the pathology.

Under the postural adjustment provided by **Zhan zhuang** and sufficient training period, not only the Central Nervous System but also the Peripheral Nervous System will benefit from this better signal excitation: signal transmitted with faster switching, larger amplitudes and lower level of noise.

### *Recommended for cardiovascular patients*

According to conventional medicine point of view, patients suffering from cardiovascular diseases should not practice athletic sports as it is very difficult to define the quantity of physical effort they should be submitted to: the resulting acceleration of heart rate and suffocation may not simply be bearable to them...

But in Zhan zhuang you do not have these inconveniences: you can control precisely the level of physical effort through the posture itself or by selecting the appropriate posture: in this way patients of cardiovascular disease are very safe when practicing **Zhan zhuang** and enjoy its healing benefits.

### *Better breathing*

In **Zhan zhuang**, when both hands are assuming a showing lifting-holding posture, in the same time the pressure naturally generated by both shoulders on lungs is immediately suppressed and this will allow both lungs to increase naturally their vital capacity. During post standing process, you improve your breathing ability: you will see yourself with larger movements of thoracic muscles while installing a natural abdominal breathing.

This type of natural abdominal breathing is without any side-effect (in comparison with others which do have some) and can strongly massage intestines and stomach, curing from constipation, strengthening digestive and excretive functions. And the recovery of these basic functions will



lead patients to gain rapidly a strong and rejuvenating body, but also readjusting situations of overweight or anemia.

The premature aging of vital functions is often resulting from many years lacking of physical activity. Persistent practitioners of Zhan zhuang will slow down aging process and will be often remarked as looking younger than people of the same age.

When we become adult the heart's function of blood transportation will decrease around 1% every year, so that when we reach the age of 60, the speed of blood flowing from both arms to both legs will be 30%-40% slower then when we were 20.

At 70, nerves will transmit information with a speed slower from 10% to 15% compared with their optimal speed.

But this current aging process affecting senior generations is closely related to the physical effort they are involved in.

In practicing ***Zhan zhuang*** they will regain better ability to maintain calmness and decrease their heart rate while promoting on each heart pulse much blood through out the body.

If they persist in post standing and its complementary techniques, this will improve their general blood circulation and breathing function, the enhancement of contractive muscles involved in these exercises, will help to protect joints from sudden injuries or damages, avoiding cirrhosis, in the same time their body will be able to fix more calcium and will reduce the process of bone loss.

We have just described previously some specific therapeutic applications of Zhan Zhuang, everyday there are numbers of practitioners in the World who are discovering new benefits of this amazing exercise and there are such large areas of research which are already profiling and would request the contribution of practitioners and scientific specialists to continue its development for the well being of the whole humanity.



## **I.2 Body's reaction after Zhan zhuang**

Through Zhan zhuang training the functions of the internal body will change and this will come with different reactions you can perceive in your body as shown below:

### *I.2.1 Tingling feeling*

Tingling feeling is a body reaction intervening often for beginners. When it starts the feeling maybe be uncomfortable, but after some time we generally get use to it. Along with the period of time assuming Zhan zhuang, the localization of tingling reaction may also change: for example it may start in your finger then move gradually in your foot, leg, shoulder and later back etc... You can feel also in addition a sensation of “ants walking” on your skin moving from one area to another. This is in fact the results of dilation of blood vessel capillaries, as the blood flow is increased through post standing.

### *I.2.2 Swelling and aching feeling*

After around one to two weeks of daily training, you may feel in your leg, knee, waist, ribs, shoulder, neck, etc...different degrees of swelling, aching and tiredness in the whole body, this is in fact a natural physiological reaction of the body after this starting period of post standing: within additional one or two weeks of training, this sensation should disappear.

If parts of body were wounded in the past, during post standing these old wounds may suddenly reactivate pain, this is called “old wound” reaction. There is another type of local reaction, for patient suffering from neurasthenia, it may trigger headache, those suffering from stomach and intestines diseases may feel abdominal pains, those suffering from arthritis sufferer may find their joints swelling and aching, for people suffering from goiter (large swelling of a thyroid gland) may have local feeling of “needling” (or acmesthesia), etc... All these reactions will generally disappear by themselves within 3 to 10 days. They are in fact good preliminary signs of recovery as they



are testifying the very significant changes happening in the internal body with Zhan zhuang practice and reinstalling virtuous metabolism functions.

### *1.2.3 Warming feeling*

After 20 minutes of **Zhuan zhuang** the whole should get warming feeling and if you increase the physical effort involved in (we will see below how to increase it) you may even perspire. The amount of perspiration is closely related to the amount of physical efforts involved in standing (physical efforts are depending on the two parameters *total time of standing* as well as the *bending angle of the joints* during standing).

When you can reach perspiration state in your post standing your whole body will feel a special relaxed sensation of well being.

Another reaction can be due to the stimulation of digestive function, as better wavelike muscular contractions of the alimentary canal, bringing many people to belch or to fart.... Sometimes large outburst of intestinal gas may appear noisy and embarrassing but in any case it provides comfortable relief!

### *1.2.3 Vibrating feeling*

To assume correctly your posture you need to keep your four limbs muscles incessantly contracting and relaxing.

So as time goes your working muscles will progressively bring up quivering. In the beginning quivering should be quite light, you can't even see it, but once you touch locally (knee, thigh ...) you can feel it. Later quivering becomes more obvious and you'll be able to see your muscles contracting regularly.

Then later you find pulsation phenomena, sometimes the foot may stamping on the floor in a "rub-a-dub" movement.

After passing some times in pulsating movements, muscle endurance and nerve system control reach a new level of achievement so that pulsating movements will rapidly diminish and even disappear.





### *1.2.3 Asymmetry feeling*

#### *a) Left/right level asymmetry*

During post standing training it often appears obvious dissymmetry between both hands position while the practitioner may feel by himself still perfectly symmetric.

Then if you correct back to a real symmetric left and right posture, he may feel now difference between his both sides.

The reason is that both sides are responding physiologically caused by for example a different muscular development or/and daily unsymmetrical physical effort solicitation in each side.

#### *b) Left/right different level of numbness*

In post standing you may feel in one side swelling and needling but in the other side absolutely no swelling and needling, or for example one side headache and the other side no; one side feeling comfortable, then other side no, etc...

This feeling is very obvious for patients suffering from high blood pressure and those from hemiplegia.

#### *c) Left/right different level of perspiration*

Some practitioners, due to unadjusted nerve excitation may perspire abundantly in one side while the other side is completely dry.

For example the case of facial asymmetry: right side of the face is perspiring but not left side. This dissymmetry has been frequently demonstrated under clinical tests.

### *2.5.4 Left/right different level of circulation*

In this case when starting post standing, both arms are placed at the same level, with same load (the weight of each arm) but after 20 minutes one arm's color will remain normal while the other arm will be dark purple. One side having swelling and heavy feeling from finger up to shoulder and the other side having no feeling at all.

### *2.5.5 Left/right difference of temperature*



In this case the difference between both hands is very obvious, just touching one hand you will feel it very hot, then touching the other it will very cold.

This difference of temperature has been also verified and controlled under clinical tests electronic checking each time the temperature of middle finger in certain cases this difference may reach 10°C.

There is also the case of a practitioner whose five fingers presented radically different temperatures.

Concerning these types of asymmetry feeling and reaction following **Zhan zhuang**, we have generally noted that after 2-3 weeks of constant training, all them are significantly reduced and after 2-3 months they have practically disappeared.

#### *2.5.6 Well being feeling*

Under sufficient Zhan zhuang practice, the readjustment of signal excitation quality in human cerebral cortex which is directed connected to major functions such as senses, motor and many others physiological functions, will directly improve these same functions, as a general result your internal body will reach a state of special comfort, optimistic and light in your mind, chest and belly flexible and without pressure, pathologic symptoms reducing, spirit elevated, four limbs gaining strength and whole body relaxed.

This well being feeling comes along with your progress in Zhan zhuang and constitutes a very good psychological and physiological support for the practitioner to deepen either his treatment for deeper recovery or to build more martial abilities from this basic level of training.

We have summarized all the reactions intervening during post standing therapeutics on a weekly based in the following Table 1-1.



Table 1-1 Reactions to Post standing therapeutics on weekly based

Category	Different reactions	1st week	2nd week	3rd week	4th week	5th week	6th week
Tingling feeling	Hand tingling	+	+	++	++	+	-
	Foot tingling	+	+	++	++	+	-
	Head tingling & swelling	-	-	-	±	±	±
	Half body tingling & sw.	-	-	-	±	±	±
	Whole body tingling.&sw.	-	-	-	-	±	±
	Ants walking	-	±	±	+	+	+
Swelling and pain feeling	Shoulder swelling and pain	+	++	+	±	-	-
	Neck swelling and pain	-	-	+	++	+	-
	Knee swelling and pain	+	++	++	+	±	-
	Leg swelling and pain	+	++	+	-	-	-
	Waist and rib pain	-	±	±	-	-	-
	Old wound pain	-	±	+	-	-	-
	Local reaction	-	-	±	+	-	-
Warming feeling	Belching	±	+	+	+	±	±
	Farting	±	+	+	+	±	±
	Abdominal noise	-	-	-	±	±	±
	Warming	±	+	+	+	-	-
	Perspiring	±	+	+	+	±	-
Vibrating feeling	Vibrating	-	+	+	+	-	-
	Quivering	-	-	+	+	-	-
	Pulsating	-	-	-	+	+	-
Asymmetry feeling	Left/right hand level	+	+	+	+	+	+
	Left/right leg bending	-	-	+	+	+	+
	Left/right tingling & swell.	-	-	-	±	±	±
	Left/right perspiration	-	-	±	±	+	+
	Left/right circulation	-	-	-	±	±	+
	Left/right temperature	-	-	±	±	+	-
Well being feeling	Head relaxed	-	-	+	+	++	+++
	Chest relaxed	-	-	+	+	++	+++
	Whole body comfortable	-	-	+	+	++	+++

Note: Levels of reaction are indicated as followed:

“+ + +” indicates highest perception; “+ +” for very strong; “+” for significant;; “±” for the limit between having and having; “-” for none existence



From List 1-1 we can notice that after two weeks training post standing, tingling, swelling, aching and pains reactions become more obvious, on the third week, then they can gradually be reduced. In the contrary, before 2-3 weeks of training, one's may not in general feel the well being sensation, but after 3-4 weeks it should could appear progressively; for a longer period of training well being sensation should be more obvious. After six weeks on training and with appropriate adjustment of physical efforts in the training: tingling, swelling, aching and pain reaction may appear again before disappearing after a certain time of practice. In fact these incessant situation coming/fading back and forth are the external signals paving the enhancement of curative effects and the strengthening of your overall body.



## **I.3 How come Zhan zhuang (ZZ) has curative effects?**

You can sometimes hear from some students these following remarks:

- “I know another practitioner who started Zhan zhuang exactly in the same time than me, but later I found out that he is progressing in his training much faster than I do? How can it happen?”
- “I am training ZZ in a daily basis but still I do not get any kind of curative effect”,
- “ Effects were very obvious during the first three months of ZZ practice but even I am still continuing to practice ZZ after these three starting months effects seem to be much less obvious”.

The key points for all these cases are that three parameters in their training program have been scaled down:

- insufficient training time,
- insufficient bending angle,
- insufficient mental activity.

Let's go deeper for each of these parameters.

### *I.3.1 Insufficient training time*

Let's see two major aspects related to ZZ training time:

- Z.Z training time is not enough: It is very easy to persevere on standing during a short period compared to long one, but the effects of short time standing are, as you can easily understand, very limited. For a longer period of time in standing, your internal body has progressively more rooms to gather more beneficial effects.

It is evident that standing time is related to everyone's physical conditions. For example elder people or patients under medical treatment cannot hold continuously ZZ during 40 minutes but rather 10 minutes. Although 10 minutes is not very long but it's still enough to get some healing effects. In opposition for a confirmed athlete or a manual worker with great physical conditions, 40 minutes training may not bring out any effect.

There is also the frequency of training each day: some practitioners will practice just once a day, but others will practice three or four



times a day, and of course expecting effects will be also different.

- total duration of training program is insufficient: we mean from the time you started your ZZ program until now.

A serious Dachengquan practitioner should not be restricted to short term objective in his training program: as to continue the analogy with nature, anyone understands how seasons influence the progress planting/harvesting: It simply takes several months to harvest or pick up fruits...In the same way the recovery process requests some significant time to bring out some qualitative improvements and progressively up to more obvious ones. Temporary health problems can be rather rapidly cured compared with chronic diseases.

Although Zhan zhuang has proven effects to cure patients suffering from chronic diseases and strengthen their bodies, results cannot be obtain in one day, it needs time...

To sum up we can say that adequate training time is relative to each one's physical condition and illness seriousness but in any case with a long term training program including proper time training adjustment is the preferable way to settle durable and concrete results.

### *1.3.2 Insufficient bending angle*

Insufficient bending angle in your four limbs while assuming post standing will develop an insufficient amount of physical effort during your training session.

Here again bending angle should be set up according to one's physical condition and also the posture which is selected for ZZ exercise: its frequent adjustment in your training is necessary.

For example in beginner level, the bending angle in both legs should quite small as in the beginning the practitioner cannot endure to large amount of physical effort.

After a certain time of practice the bending angle should increase as the body has acquired further strength so that the actual angle does not produce anymore substantial changes in organic function of the body.

In **Zhang zhuang** selecting the right bending angle is among the most difficult point to achieve as determining the ideal amount of physical effort is very hard to estimate, this requires a very experimented





coach which will constantly check, readjust angles but also from the practitioner himself in scanning and feeling inside his internal body all changes intervening during his training program.

### *1.3.3 Insufficient mental activity*

Insufficient mental activity occurs generally when the practitioner has not completely understood the function of mental activity in the training.

Mental activity in ZZ and affiliated exercises should be adjusted according to each practitioner's condition, if it applies, his pathology, the posture he assumes, but also the level of training he has already achieved.

To be more specific: convalescent or patient should rather focus on preserving calmness and control nerve excitation, then once they recovered they can increase the amount of physical effort involved in training, so that recovery can be more stabilized and permanent: at this stage they can on developing sensibility to low level signal or directly increase the amplitude of nerve excitation while monitoring it mentally. Here are some further details:

For a patient starting ZZ the most important is “mental vacuity and posture lightness” during his exercise. He should just keep on assuming his posture without moving and use mental activity for relaxation, for example he can check mentally if each part of his body is relaxed. In the beginner he will not be able to keep all his muscles relaxed but with more training his muscles will be able to get rid of the excess of strain and rigidity. During a certain period it may be difficult for the practitioner to appreciate himself his progress as everything is happening and starting inside his body. But with further training and fine monitoring of minor changes will lead him progressively achieve this first step.

In the following step, he can apply “mental and posture lightness” in his ZZ training. Here in post standing, body is actively teaming up with mental: focus your mind, get rid of random thoughts, monitor your internal body and soon will appear varieties of changes and reactions within it such as tingling, swelling or pains, then they may also continue to grow up until he reaches the sensation of well being.

Again the more these sensations are obvious the better it will assure



healing benefits.

For practitioners with good physical condition, they can go ahead training more specifically mental activity related to cycles of contraction and relaxation, using “monitoring mental and still posture lightness”. This specific post standing training involves resting muscles into contraction-relaxation cycles and high level excitation in the cerebral cortex. This type of training is much more complex and requires a meticulous preparation which we will discuss later in this book.



## **I.4 Monitoring decompression method**

There is a method which can explain more concretely the effects of ZZ to the human body: it is the “monitoring decompression method”.

Let's describe this method.

Start your post standing, lift both hands, both elbows separated from ribs, keeping suitable angle, upper limbs assuming “holding object” or “pushing-lifting” posture. As you are holding this posture, your upper limbs should reveal three points:

- reduction of the natural pressuring force issued by two arms on lungs,
- increase of endurance and power for muscles of arms and forearms,
- existence of physical strain for thoracic muscles and nerves under this supportive posture.

Ordinary everyone does not pay attention to the oppressive pressure that arms inflict to lungs but with this decompression method it becomes really obvious.

Another exercise: starting your standing posture, two feet shoulder wide apart, two arms alongside the body, then slightly lift right hand, place it under shoulder level and in front of chest, right elbow bent as holding an object; muscles of right shoulder should be relaxed, do not use force or raise right shoulder. Left hand is naturally dropping down and not moving.

At the same time especially concerning you can appreciate the differences between left and right lungs count silently deep breathing cycles, especially in terms of quantity of air sucked, oppressive feeling and relaxation feeling, etc...

It becomes obvious that the quantity of air sucked by right lung is sucked more air than left lung did and in your right side of your chest you feel more flexible, more freedom with an unusual sensation of well being. In the opposite your left side (dropping hand), you sucked less air and realize the existing pressure on left lung generating oppression feeling.

Just inverse lifting side and you will find out that these sensations are also inverted.

We can see that through this simple exercise ordinary people aren't aware about situation where they are inflicting themselves oppression and tension and that ZZ precisely suppresses but also helps to gain strength/endurance in upper arms and allows lungs to extend their lungs



function.

In daily life we can observe how we feel more comfortable sitting on a large arm chair than on a wooden stool. The reason is that both hands are supported by arms (of the chair) in the first case, separating your elbows from your ribs. The comparison stops here because sitting on these arm chairs you will not develop any strength and endurance of higher limbs.



## **I.5 Simple explanations for the quantitative and qualitative changes generated by Zhan zhuang**

Practicing ZZ is a physical training i.e. applying to one's body external conditioning.

It is in fact this external conditioning of the body which creates the exopathic factors that brings up changes in its physiological functions, we call it, to simplify, internal conditioning.

From external it becomes internal, we can also say that from quantitative (external training) it becomes qualitative (internal changes), later it will change from qualitative to quantitative, and so on, developing incessant cycles.

It is precisely through this cycling process which will lead patient to recover and regain a stronger body.

This physical conditioning method is highly subjective (in the sense - "perceived by the patient and not by the examiner"), involving himself to this progressive internal enhancement as a proven effective healing method for chronic diseases.

It comes with what I call the "Second kinetics physical training" and this involves simultaneously mental and physical development. (I will develop this subject further in this book).

When we are normally standing, our heart rate is normally between 60 to 80 beats per minute, our respiration rate between 12 to 18 breaths per minute, these are invariable numbers corresponding to a resting state.

We are going to start with these values to initiate our study on the relationship between quantitative changes and qualitative changes in the body (generated by ZZ).

Human body just assuming an ordinary standing cannot increase neither pulse rate nor breathing rate: clinical measurements will prove unchanging values.

But if you assume ZZ, joints in your whole should keep fixed angles to assure your body to be stable and balanced. Under this condition, each part of the body is submitted to a fixed force (gravitation force), so skeletal muscles are requested for more work out (contraction/relaxation) compared with ordinary standing.

As we said before ZZ provides a physical conditioning (external change)



which will bring out change in internal body such as changes in physiological functions, in a word ZZ helps to shift from a resting state into a dynamic physical training estate, from resting estate into stimulated estate, that is what I call *quantitative changes*.

Let's take an example: Before training and in resting conditions your heart rate is 74 bpm and respiration rate is 19 bpm, now assume ZZ and bend your knees so that your total height is 3cm less than in ordinary standing (straight knees) after 40 minutes you will reach 106 bpm heart rate and 30 bpm respiration rate. So by just tuning your bending knee angle and the time of standing position, it results clear responses from your heart and respiration: external conditioning has been changed into internal conditioning which I call *qualitative changes*.

Space (joint angle) and time are both quantitative parameters which are combined in the same physical training, defining its amount of physical training.

We have already explained that amount of physical efforts required should be set up according to the practitioner physical condition.

We know also that this amount of physical efforts required in ZZ may vary with the improvement of his condition.

Then it becomes clear how important is to set up constantly new values of angles and standing time if you want to continue to benefit from these internal changes.

For example after half month practicing post standing with two legs bent (total height minus 3 cm), from the normal pulse rate and respiration rate of 68 bpm and 18 bpm respectively, after your 40 minutes training session your heart rate will reach 89 bpm and your respiration 22 bpm. These tangible changes in heart rate and respiration rate, qualitative changes are turning into quantitative changes.

The improvement of one's physical condition may appear in the very beginning of your training program rather imperceptible, let's say microscopic but already significant changes in term of physiological functions which can at that only perceive under specialized and very accurate medical instrumentation.

Then it is only after sufficient amount of these changes that the quantitative may appear.

To put it simple, physical (condition) change occurs through modification of physical efforts during ZZ practice and its hard cumulating process.





According to Friedrich Engels (1820-1895):

*“...qualitative changes can only occur by the quantitative addition or subtraction of matter or motion (so-called energy). Hence it is impossible to alter the quality of a body without addition or subtraction of matter or motion, i.e. without quantitative alteration of the body concerned...”*

( Engels - 《Dialectics of Nature》 )

Here matter is your physical body, quality is your physical condition, quantity is the amount of physical efforts (exopathic factors) you are submitted and the heart/respiration rates (internal causes).

After practicing ZZ all these “quantitative” can be accurately measured. When post standing and practice technique this quantity is could accurate measured.

ZZ gives you the ability to recover from disease and to gain better health, changing from a weak body into a strong one, from “pathological” to “physiologically correct”, changing from quantitative into qualitative, from qualitative into quantitative, these cycles leading you to enhance the internal physical condition.

But even after a long time of practice it doesn't mean that a weak body condition is gone forever: for example the exopathic factor changes again i.e. you stop practicing ZZ then this will influence again your internal body, this time your health will regress.

The message is that one's should constantly take care of his “exopathic factor”. i.e. practice ZZ, bringing to the body the relevant amount of physical effort, in the same time, regenerating and strengthen your body.

In fact you should constantly monitor the “accommodation” factor of your physical condition, once you've reached a certain level of practice for a certain bending angle in a certain posture of ZZ, your heart rate will not increase, and in the same time your respiration rate will also not increase, in some cases they will even be lower than in original resting rates.

At this time it is important to increase again the level of physical effort which you are submitting your body: from 2 cm bending angle increase progressively to 4, 6, 8, 10 cm or more...or can also increase your second



kinetics training: more contraction/relaxation cycles under mental supervision: this will invariably bring your pulse and respiration rates to increase then decrease, and increase again then decrease again and so on...The same cycling phenomena for sensation of pain: first pain then no pain, later pain again and later no pain again...

Translated into Engels's formulation, it is your body manifesting quantitative change then qualitative change, later quantitative change and later again qualitative change.

This is the truly message of progressive method, allowing your body to digest, integrate and develop its healing and strengthening abilities: your body will pass progressively from low-level to high level manifestation, bringing in the same time from basic up to sophisticated abilities (which will be described later in this book).

I call it the “High quality training method by degree increment”. See Table 1-2.

**Table 1-2:**

High quality Zhan Zhuang training method by degree increment

Angle/mental activity	Increase → maintain → increase → increase
Pulse and breathe	Increase → reduce → increase → reduce
Human body reaction	Pain → no pain → pain → no pain
Physical change	Quantitative change → qualitative change → quantitative change → qualitative change



## I.6 Relationship between Zhan zhuang and Martial arts

In martial arts literature, we can find many references to ZZ. I selected some which described more specifically the relation between ZZ and martial arts: here is a chapter included in the written training materials released by the China National WUSHU Committee in 1961:

*“Basic training in Ancient Times focuses first on flexibility and power of legs, waist and arms while in the same time adjusting breathing for internal organs through leg technique, waist technique, arm technique and also post technique, etc...”*

*From all these major techniques, post technique has its unique training properties in martial arts. With this stillness standing method you can practice and cultivate breathing, increase your power, reshape and homogenize your movements. Zhuang means “post” this requests you to observe stillness and stability as a “post”, within this practice of non-moving and internal breathing, your strength will increase, you are “seeking moving inside non-moving”; another aspect is that through ZZ method you are remobilizing your breath and increasing strength: lower limbs can maintain stability as a post, in Shaolin boxing about secret techniques it said: ‘if you become proficient horse standing (Ma bu standing), then Qi penetrates Dantian, you become vigorous as an immortal’. Whatever boxing styles or schools, all practitioners should first master it (post standing).”*

Here are many types of ZZ for example, *Hunyuan* (All-round) zhuang, *Siping* (Four planenesses) zhuang, *Santi* (Trinity) zhuang, Empty step post, Bow step post, etc...

But we can find two main categories of post methods:

- The first one is “seeking moving in non-moving”, this method is targeting stillness by facilitating whole body *Qi* and blood to circulate easily and smooth. Reaching stillness is the principal condition: you must get rid of all random thoughts, keep body erect, chest comfortable, belly relaxed, whole body relaxed, breathing steady, reaching gradually emptiness and stillness.



It is only in stillness that *Qi* can transmute from clear into balanced, then from balanced into harmonious, then from harmonious into smooth, then smooth into very fluid (blood as well). The *Hunyuan* or “All-round post” belongs to this category of post where we are “seeking moving in non-moving”.

- There another category of post methods: based on the principle “seeking non-moving in moving”.

In this category, methods focus on *Qi* stimulation, allowing *Qi* in strained condition to maintain imperturbation and steadiness, storing in your spirit all its unstained character, merging with power and spirit.

All these methods are based on dynamic exercises.

Here dynamic exercises are involving the whole body into physical exercise and are “sticking out” the chest of their practitioners.

In these conditions, *Qi* is easily ascending and effusive but also hardly descending and returning to *Dantian* area: this makes stillness not easy to achieve...

It is only after long years of practice that you can control the impetuosity of *Qi*, reaching stillness and supplying sufficient oxygen to internal organs during dynamic exercises.

“Four planenesses” post is one of those.

When practicing this you should concentrate on planeness at the top of head, shoulder, leg and in the heart (mind).

In a book of Cai Wangzhi, written during the Jiaqing reign of the Ming Dynasty (1522-1566), it is said:

*“When top of head is flat then head is erect,  
when shoulder is flat then body erect,  
when leg is flat then force is positive,  
when heart is peaceful then Qi pure.  
It is only with the achievement of Four Planenesses  
and Four Rightnesses  
that you can merge Internal with External  
and also have Strength, Qi, Spirit and Power  
all being merged together.”*

“Secrets of Huaquan boxing” - Cai Wangzhi



ZZ has not only the advantage to train and build up your body, but it has also the important property to suppress the rigid form of power.

Let's take for example Horse stance, Climbing Mountain Stance, Empty Stance, etc... all can be used as posts techniques to achieve a supreme expression of power.

The type of post should be selected according to the specificities of each martial art style.

The basis of Chinese martial arts have greatly influenced also other Chinese arts such as Opera or Acrobatics, each discipline having developed their own specialty from this same and common basis, considering it as the unavoidable barrier to entry and the ultimate way to achieve mastery.

What are the benefits of consolidating basic techniques training?

- First, you can improve very rapidly your physical condition,
- Second, with very good basic techniques you can easily grasp application movement, as movements are direct extensions of stances,
- Third, solid basic techniques are the necessary foundations for top level techniques,
- Fourth, they can avoid you from getting harmed or injured during training.
- Fifth, they can prolong the duration of practice. Through accurate and regular basic techniques training, practitioners can still continue to practice even in advanced age.
- Sixth, basic techniques training can enhance the quality of your movements, improving every joint's elasticity and every muscle's control. As a result, your movements are more harmonious, presenting their own beauty and in a word your body reaches a state of "highly adaptative while being in perfect control".

No matter how good and how much the basic techniques you have selected. You should not expect real result without sufficient time of practice. Ancient martial arts experts described the ideal training as: diligent, hard, continuously stressing on "practicing the three ten-day periods of the cold winter, and three ten-day periods of the hot summer", in a word practice all the year long.

In our time practitioners should also continue to learn from these empirical methods and carry forward this traditional spirit in martial arts.



Selected from 《Beijing Physical Education》 published in 1982 -  
《Shaolin, top martial art of past Dynasties》 - First edition:

*“As we continued our visit: Hall of Abbot, Hall of Damo. On the uppermost level of Shaolin Temple sits the One Thousand Buddhas Pavilion. From the outside, it seems a quite ordinary hall of weathered gray planks and stone, but inside 48 indentations in the stonework of the floor immediately grab the attention. Careful examination reveals they are set in pairs and positioned in straight rows, each depression approximating the size and shape of a human foot. In fact, decades of stamping feet of practicing monks eroded the stone slabs.*

*A 70 years old master said: “During the past Chinese dynasties monks used to practice post standing but later this practice was forgotten. You should take this as an important indication.” Someone asked: ‘What is the meaning of post standing?’”*

*The old master answered: “Post standing is a fundamental exercise” and added while demonstrating: “both legs and shoulders should be straight, Qi moving into Dantian, ten toes like grasping ground, up to reach the ability, from this fundamental boxing training, to walk as Taishan Mountain.”*

*Another asked: “How long do we need to practice post standing?”*

*The old master answered: “This fundamental exercise should be practiced at least three years before one can assume the right posture.*

*These depressions indicate us how Shaolin monks built up their supreme techniques.*

*Another student excited after listening to these references, prayed the old master to continue to present this forgotten technique, arguing that every member of his audience was listening to him with this common great interest.*

*The old master added three points in his discourse:*

*- First: that ZZ has always been an essential exercise in Shaolin Boxing and commented: “If you want to reach a significant level in Boxing and walk as steady as Taishan Mountain you should first practice post standing.”*



- *Second: he confirmed more generally that ZZ constitutes the fundamental exercise of all Chinese martial arts.*
- *Third: in the sentence “This fundamental exercise should be practiced at least three years before one can assume the right posture.” It indicates that most people can hardly imagine the importance of post standing even if it is backed by a very powerful philosophical principle which should convinced anyone to consider it very seriously.”*

The benefits that anyone can gained in practicing of post standing should invite anyone to research on it and when it is possible even to use the most updated scientific apparatus to carry on scientific experiment and research. This will deepen the knowledge of a growing community very concerned by its physiological characteristic while perpetuating the precious cultural inheritance of Chinese martial arts and contributing directly to health and longevity but also successful development of mankind.





## I.7 Relationship between Zhan zhuang and Taichi Chuan (or Taijiquan)

It is quite common to hear someone asking: “Between post standing and practice Taichi Chuan what should give me more benefits?” I think that both ZZ and Taichi Chuan have inherited from many years of research and refinement, from traditional sources, contributing greatly to promote a healthier life, as a preventive but also complementary physical activity for the whole Chinese country. However each one has its specific merits. From the purely technical aspect, post standing can be described as the basic technique in any Chinese martial arts and even in any sport: it has constituted originally Taichi Chuan’s basic technique.

In 《Taijiquan Sword pole and Sparring – New edition》 (by Chen Yanlin, Shanghai Research Publishing House, 1949) concerning Taijiquan’s method of training and its learning phases, the author wrote: “Nowadays a *Taijiquan*’s beginner can start with 13 postures (called also *pan jia zi*, starting form or Day length Boxing). It would require generally just three or four months to learn the form. They are completely away from the original way of training of the elder generation who started with horse step post standing, *chuan* step post standing etc... as to build up their basic physical abilities. This learning phase can be very long, and it is only after fully mastered it that the practitioner can learn the frame of 13 postures where each posture would require several months of practice. Each posture should be mastered one by one as well as its applications then finally one’s can practice the complete frame of *Taijiquan*. This means that traditionally it will take many years before practicing the whole frame, then perfecting it endlessly.”

In this same book there is a special paragraph introducing Taichi Chuan’s post: “*Taijiquan*’s post steps include horse standing and chuan standing. In the ancient times practitioners of *Taijiquan* should first practice these both standings, to gather more strength in lower limbs, refraining from swaying randomly, then training with pushing hands exercises, which was considered as a reliable method.

This methodology is similar to the one used in building construction, if the foundations cannot remain steady enough how can you build higher and larger buildings?

It is a real pity that most contemporary experts do not start from this





fundamental exercise and then advance gradually. Instead of this approach they are directly starting with the complete frame and pushing hands. Any serious martial art practitioner should know if he does not pass this reinforcement of specific physical abilities, his lower limbs will lack of power and his center of gravity very easy to be deflected. This is the reason why I would like every practitioner to pay a special attention to this basis: avoid assuming too low postures, avoid imitating too perfectly any posture. When practicing pushing hands: one should simultaneously stamp on the ground and adhere to one's opponent, then simultaneously pressing while facing him upward ready to attack him. In a word, any serious practitioner of Taichi Chuan should first practice post standing. The training of post standing should not be restricted to the notion of duration for the standing itself but rather on how long can the practitioner persevere in his training and make it effective.”

He wrote also on Horse Standing and more generally on post standing another paragraph: “In the beginning it will require you just five minutes of training and progressively you will increase the duration of this training. Later, after a long time of practice your lower limbs will gain in power and your whole body including your four limbs will gather a greater internal strength while your *dantian* will also be full of *Qi*.”

He wrote also about post standing: “practice this post standing, no matter time how long or how short you can dedicate on your training, if you can persevere, this will bring all benefits: enhancing your internal body and your mind, promoting Qi circulation, your whole body gaining an internal strength while waist and leg are acquiring physical abilities for martial arts. The training of this posture includes extensions with forward, backward, right and left, centering, and attack/defense etc... all these extensions being essential in *Taijiquan*. Previous generations of practitioners have invested merely decades: persisting morning after morning in this training. This posture involves mind, spirit and Qi, so any practitioner of *Taijiquan* should not underestimate it.”

Horse standing corresponds in fact to the second posture up to the fifth posture of post standing techniques. Chuan word post standing is similar to the sixth posture. But each posture has its specific angle of joints combination and its specific mind activity, etc...

Taijiquan's movements are soft and slow, limbs are bending and extending through a large variety of movements, developing in all directions and capturing easily the attention of the audience.

Post standing technique requires the practitioner to maintain his



posture in order, in the first stage, to work the First Kinetics of physical exercise which is rather easy to perform. In the following stage, one's should use further conscious control of "resting" muscles to bring up contraction and relaxation in order to achieve the Second Kinetics of physical exercise. Because it does not require any bending or extending movements for the limbs, this exercise will appear to any beginner, unusual, over-passing his dynamic references, very difficult to perform and extremely hard to endure.

Post standing and Taijiquan have the common goal to combat diseases, to strengthen body and to enhance its physical abilities. Regarding this aspect, post standing and Taijiquan have all proven effects. But if we want to go into further details, it should be through a better understanding of the process of contraction-relaxation involving each muscle and nerve of human's body. Through the mastery of this process, new physical abilities can be obtain for simple movement such as basic upper limbs movement but also extended in pushing hands, sparring and free fighting. Describing these new physical abilities is quite complex.

In Taichi Chuan we are talking about *listening force*, *understanding force*, *converting force*, *controlling force*, *dominating force*, *borrowing force*, *sticking and adhering force*, *silk reeling force*, but also *ward-off*, *roll-back*, *press*, *push*, *pluck*, *split*, *elbow strike... forces*.

In post standing techniques which include testing force, whole body testing force, fixed position issuing force, issuing force with step, and many other exercises, you can find; frontal force, transversal force, triangle force, supporting-holding force, spiral force, leverage force, axle force, pulley force, tension force, bursting force, springing force and shocking force, etc... Although their name may be different, but all these forces require a similar issuing "force" process.

They are just differentiating by how is achieved this issuing force: high/low, deep/shallow, fast/slow, large/small amplitude... this issuing force process can be refined through pushing hands and sparring, and many others circumstances of confrontation where theoretical principles are validated with field experience.

All experienced Martial Arts experts agree that it is only after many years of post standing that one's acquires these new physical abilities which we call "internal strength" of "martial power". These new abilities will be decisive in one's attainment in martial arts.



## **1.8 Further indications concerning Zhan zhuang**

1. Before starting post standing you should have already empty your bowels, avoiding from interrupting your post standing,
2. Before post standing you should loose your tie and belt, take off your watch, open shoelaces so that all limbs feel free to move.
3. For beginner in post standing and convalescent practitioner with weaker body, during your post standing exercise you should not close your eyes. Later when you can reach during each training session at least 20 minutes of standing and feel relaxed and happy, than you can naturally close your eyes. But if when you are closing your eyes you feel dizzy or lack of balance, do not hesitate to reopen them and continue your training with eyes opened and looking to a fixed direction.
4. When post standing do not contract your lips but also do not leave your mouth open. Just keep it naturally closed. Upper lip and lower lip should keep a slight space with your teeth.
5. The therapeutical effects of post standing come mainly from the characteristics of the posture itself and your aptitude to maintain it. During this exercise you will progressively taste all different changes happening in your internal body. If you have difficulties to calm your mind you can for example count your breath cycles, a complete cycle including inhale/exhale. But in any case avoid from holding your breath or accelerate/prolong consciously your breath rate. Let your body install by itself breath rate instead of trying to control it.
6. The best time to practice post standing is during set sunrise/sunset where you are not exposed to the dazzling effect of sunshine. In winter and in autumn post standing becomes a very comfortable exercise at these periods of the day.
7. When you are practicing post standing indoor, make sure to refresh regularly the air, temperature should be suitable to the season and try your best to select a place with very quiet surroundings.
8. When leg's muscles are initiating vibrations and your body is starting to sway forward and backward, at this time you should pay attention to control the swaying amplitude: not too large and rather slow. You can use swaying leftward/rightward to control swaying forward/backward. Your swaying movements should be rather reduced in amplitude and low in frequency.



9. At the end of your post standing, you should reduce gradually the amount of physical effort you are enduring: slowly straighten up your both legs, slightly lower your both hands, place back of both hands on your lower back (in front of kidneys) and rest 2-3 minutes. Wait that any sensation of tingling, souring, swelling and aching in four limbs has completely disappear before changing posture.
10. Concerning people suffering from insomnia and more generally practitioner planning their post standing exercise before sleeping, there are two categories of possible scenarios:
  - a. Just after ending the post standing session, If one will rapidly fall asleep: one belongs to the “apathetic” type. In this case one can practice post standing just before going to bed.
  - b. After post standing one will be rather excited: one belongs to the “nervous” type. In this case the best option is to practice 2-3 hours before sleeping, so that one will have around 1-2 hours to rest, slow down one’s excitement and prepare to a normal sleeping process.
11. Below half hour before or after meal, post standing is not suitable as it is preferable to avoid interference with the normal course of your appetite and digestion.
12. For women in period of menstruation, in the case that there is no perception of discomfort, they can continue post standing exercise but it is recommended to reduce the global amount of physical effort involved in training. If there is any undesirable reaction, they should immediately rest and wait to pass their period of menstruation to restart again post standing.



## **II.The basic theory of post standing**

### **II.1 Relationship between sport and medicine**

Human body's structure and functions are not invariable entities, the more you use a muscle the more it will develop, the more you practice a sensorial function the more it will become acute, in a word the physical condition of human body can be modified.

It is scientifically proven that all medicaments on the world can't replace the effect of relevant practice of physical exercise.

Physical activity and training can transform weak body into strong one, strong body into even stronger one. Physical training can bring benefits to each aspect related to human's health, therefore constitutes its most precious treasure. You cannot acquire a stronger body by just "taking care" of it, so the only way to build it up is physical exercise.

By combining with favorable psychological conditions such as higher combative willingness, optimism, self involvement in learning process, daily work out... all these parameters integrated in a comprehensive physical training program are offering to your body extremely favorable conditions to strengthen it, preventing it from diseases while increasing its efficiency in working environment and certainly prolongs its life.

Scientific experts have clearly demonstrated that it is the lack of physical exercises which is the origin of various diseases such as those related to overweight, diabetes, cardio-vascular diseases, high blood pressure, gastric ulcer, etc...all belonging to the category of "modern" diseases. Because of this lack of physical exercise, cardiac, pulmonary and digestive functions, but also the whole body's metabolism function will gradually decline faster than the natural course, vascular elasticity weakening this will decrease the resistance against many diseases.

So if any senior or any patient with a weaker body, wants to gain a healthy life: he needs physical power: he should train according to a suitable physical training program including progressive steps in building up physical power.

A rational physical training can improve the whole body's physical conditions, strengthening nerve central system and each physiological



function, even enhancing its adaptability in front of unfavorable external environmental conditions, increasing its overall resistance and repulsing illness. In case of patient suffering from chronic disease, it may reduce significantly his pathology and symptoms associated. The preventive aspect of physical exercise constitutes certainly one of its most interesting ones.

Physical training under medical treatment is currently used nowadays: the patient needs to get involved in a physical training program with the objectives to improve his pathology, his general health and prolong consequently his life. These curative treatments through self involvement of patients present significant advantages, the psychological positive factors such as motivation, sensation of after effort, etc... all are extremely valuable factors for the patient to recover or at least improve his pathology during his physical training program.

Each type of physical exercises has its own characteristics and required its specific condition of training. Therefore I believe that for the well being of mankind, medical researches are and should be in the way to evaluate each type of physical exercises through its physiological characteristics, as accurately as possible under strict medical or scientific conditions, so that for the whole community could have a better understanding of its possible application in terms of treatment or complement to treatment. Once medically tested and analyzed, this physical exercise can be prescribed to demanding patients for more effective and valuable medical treatment effect which may be even combined with any conventional medical treatment.

Sport medicine is a burgeoning domain of medical science. With its dual aspect, it represents undoubtedly a very promising future but also one of the most challenging as its impact may reach any aspect of medical science.

Although we are consulting a therapist in the most cases for disease treatment, an even more important task should be preventing from disease. “Preventing first” is part of China’s main guideline in the elaboration of its national health and welfare policy. The idea is quite simplistic, however it makes sense for the most populous country in the world to control from their roots as much as possible the development of diseases. It is very easy to figure out even from the example of any simple patient how much he will save time, pain, efforts and money if he can eradicate his illness from the starting stage of development. Now it is also very easy to figure out the incidence for the scale of a whole country...





## II.2 Why physical exercises are seldom prescribed in a conventional medical treatment

As we discussed before, physical exercises can improve and strengthen one's body physical conditions, promoting better health, and if they are selected accordingly to their pathologies, corresponding training may even cure radically suffering patients, then why these “physical exercises” treatment are seldom prescribed and not benefiting a larger research and development. So that anyone can enjoy a complementary way of medical treatment.

Answering this question is quite complex, without going through the organization of each healthcare system in every country, through the pure scientific aspect, there are some apparent contradictions. But these contradictions come from a partial understanding of what can bring proper physical exercises.

Let's look at some unfavorable factors that might hold conventional specialist to advise further physical exercises in their medical treatment:

- 1) The amount of physical efforts requested is very difficult to estimate.
- 2) When the amount of physical effort is increasing then the patient tends to hold his breath, so this causes a shortage of oxygen in his body leading to suffocation phenomena.
- 3) After physical exercise, in the heart: right atrium tends to enlarge and acceleration of respiration phenomena.

The above factors have properly no bad effects on healthy and young people, as physical exercises are prescribed for their development through sports, stimulating their body and mind but for senior people and patients with weak body this may be unfavorable.

Therefore conventional specialists, according this well known physiological effects issued from the mechanism of physical exercises are advising their patient mostly to rest, to reduce them dramatically and even to forbid them any physical exercise.

*“Bieqi” (hold breathing)*

In sports it is common to find this phenomenon of holding breath when athletes are performing their movements: for example in weight lifting, wrestling, and any other sport where four limbs are requested to exert a large amount of power during a short time.

So to reach their athletic performances or dominate their opponent, these athletes need to gather first their largest amount of power: this is reached



by immobilizing all muscles of trunk including shoulders, chest, back, etc...all these muscles are contracted in the same time: then shoulders, back and thorax are perfectly unmoving. In the same time for preventing thorax from any movement forward, backward, leftward or rightward, the athlete will take one deep, then holding his breath hermetically, before releasing his power and achieving his athletic performance.

In the same time, muscles of lower limbs are also strongly mobilized in a very violent contraction. As a result thorax area and air contained by the lungs are submitted to a sudden increase of pressure, whole body's muscles are strenuously contracting and relaxing, resistance at the periphery of each blood vessel is suddenly intensified, the smaller ones are compressed, finally most of blood is under the effects of internal and external high pressure, causing further stagnation in the blood vessel which is not completely returning to the right atrium of the heart.

In China, this phenomenon is called *Bieqi* (hold breathing).

According to the intensity of *Bieqi* and the special effort requested in four limbs will directly influence the contraction/relaxation process of all muscles of shoulder, back, chest etc... and also the amount of power requested. If the duration of *Bieqi* is kept on during a long time then air pressure inside lungs may increase from 13.3kPa to 33.3kPa. At this time whole body's blood circulation is blocked, this affects the peripheral blood circulation in veins, especially blocking most of blood conveyed by veins around the thorax.

When *Bieqi* is increased: first face is flushed, temples and neck swelling but in thoracic and heart area, blood supplied by veins is dramatically reduced: the heart system is badly affected by this deficiency: interfering the function of coronary arteries which are the network of blood vessels that carry oxygen- and nutrient-rich blood to the cardiac muscle tissue, heart rate becomes irregular and soon heart will stop beating and pulse disappear completely...

After a certain time following the sudden physical effort, blood vessels are dilating again allowing now blood circulation. At this time, the internal effects of *Bieqi* are fading. All carbon dioxide cumulated in lungs previously need to be expelled very rapidly from body: increase of respiration rate, simultaneously all blood retained in the veins of the thorax periphery is suddenly bursting in the right atria, dilating it excessively, accelerating pulse rate, this time lungs have excess of blood not circulating blood while being deficient in veins. Therefore this kind of phenomena happening after a certain period under *Bieqi*, brings completely opposite reactions in the blood circulation accompanied with facial flush, respiration acceleration and discomfort.





To sum up: during Bieqi, human body stops any gas exchange activity, causing oxygen deficiency or “hypoxia”, cumulating more carbon dioxide,

If someone usually repeat carrying on violent *Bieqi* sport: excessive increase of carbon dioxide in blood, shortening in blood and oxygen circulation, he will get tired rapidly, his heart being dilated and his cardiac muscle denaturalized: this will put the life of arteriosclerotic patient in danger.

So *Bieqi* sport or any anaerobic sport, does not present any benefit but only harm to the body of senior practitioner, convalescent or patient.

This is the reason why due to the physiological mechanisms of “holding breathing”, physical training is seldom prescribed in conventional medical treatment.

But, according to the results of clinical experimentations, we found that Zhang zhuang applied as medical treatment can cure diseases and promote health, cultivate and strengthen physical conditions without physiological disadvantages related to *Bieqi*.

And we know that in ZZ the amount of physical training can be perfectly adjustable.

It becomes clear that Zhang Zhuang merits more dedicated clinical experiment to research scientifically on its vast properties and benefits for its practitioners.



## II.3 Functional mechanisms in Zhang zhuang

Start your ZZ: assume your posture, hold it during a sufficient time which will bring up relevant nerve excitation in your cerebral cortex. As you are assuming a fixed posture, in the beginning, it is hard to get “inside”: your “external” sensing organs (taste-tongue, touch-skin, smell-nose, but especially **hearing-ears** and **sight-eyes**) and your “internal” sensing organs (muscles, tendons, joints) under this new stimulation, have certain difficulty to reach an adequate level due to short time of training as you cannot still control completely signal excitation level in your cerebral cortex.

### *Starting level*

But 10 to 20 minutes of Zhang zhuang may bring up some random thoughts, this is called “Manifestation of Random thoughts” Phase. To prevent from random thoughts to interfere with your ZZ practice, it is important to install in your mind the suitable and conscious mental activity. You can remind magnificent sceneries or you can monitor your breathing, you can imagine yourself stepping in a river, holding a ball or relaxing a muscle, etc...

Especially in the beginning to help you in these “monotonous” exercises (ZZ), you may hang a landscape picture on the wall, enjoy an art work such as a fishbowl, a bonsai, some flowers or grass... something nice and positive; or listening radio such as classical music, watching opera, theater, etc... Increase slightly the quality of excitation signal then you can shift back your attention which is better than just remind some pleasant memories and purely imagine the positive results, all these complementary ways are good to focus your mind, get rid of random thoughts, build more patience, reduce effects of emotions... but also this sensation of “endless” exercise, the most important is that you can protect your internal body from unnecessary excitation and accordingly improving the reflective functions in your cerebral cortex. As you are increasing your time of practice, your internal body will release some unusual physiological changes, for example, tingling in hand and/or foot, swelling and pain in both shoulders and both knees, etc... These physiological changes are called “new type of stimulation”, they are in fact “information” and also considered as manifestations of *Qi*.



### *New type of stimulation*

This “new type of stimulation” is detected through the “internal sensors” (muscle, tendon, joint): we are using the Somatic Nervous System where *peripheral nerve fibers* will transmit sensory information (new type of stimulation) to Central Nervous System. Inside the cerebral cortex it will be analyzed, integrated then information will be sent through the *motor nerve fibers* back to the skeleton.

Within this feedback process (also considered as “exploration feedback”), tingling, pain or swelling sensations but also others feeling can be detected and monitored. This is also through this process that you are able to have muscles and bones maintaining the same posture.

Holding the same position induces the same “new type of stimulation” with the same level of excitation intensity. With time and practice it will soon have no more real “new” aspect in this stimulation, the body is getting progressively accustomed to, so that later there is no more “exploration reflect”. For example, when you begin to practice some standing, you may feel tingling, swelling and pain, but as you progress in your practice, this feeling is gradually weaker until disappearing completely.

But in ZZ training program you can use a same posture but continuously changing angles and mind activity, as a result your body is constantly monitoring a “new type of stimulation” and a different level of excitation. Under these conditions the cerebral cortex can incessantly monitor information from sensorial organs and send back order up to the local motor system (muscles/joints): you have installed a strong feedback process based on this “new type of stimulation”, simultaneously any random thought or any form of unnecessary signal excitation will progressively disappear.

### *Overcoming a psychological/psychological barrier*

With ZZ training, it will bring the uncomfortable but inevitably tingling, swelling and pain sensations which, as we have already mentioned, will disappear if you persist in training. Especially in the starting phase this may discourage a large portion of beginners, but it is the cost to pay if you really want to improve your body conditions and/or recover from disease. In the same time it helps you to build up the necessary psychological background required in your coming internal/mental development.



*After one or two weeks of training*

After one or two weeks of ZZ training you will shift from tingling, swelling and pain reactions into a phase where you will experience slight muscle vibrations, in the time whole body starts to feel hot, to perspire and later it will be filled with a sensation of well being. We can also verify that the perspiration phase is bordered in one side by the acid/swelling/dump/pain phase and in the other side by the well being sensation.

This is how the human body's physiological functions are reacting when quantitative change is shifting to qualitative change.

The sensation of well being in whole body happy is in itself a positive stimulation, it indicates that for a certain amount of physical effort your body does not need any more to pass through the acid/swelling/dump/pain phase: you've passed a level and you need to set up a higher one.

With further training this positive stimulation will be more and more deep which means also that the quality of nerve signal excitation in cerebral cortex has reached the higher ratio signal/noise (here noise is referring to auxiliary or unnecessary signals) requested to reach the "internal monitoring" state.

*Arousal systems of the brain*

"Internal monitoring" involves the arousal systems of the brain.

Over the last few decades, scientists have uncovered a system of pathways within the brain, arising from the brainstem, that stimulate the forebrain and cause it to remain awake. These "wakefulness" pathways consist of nerve cells that communicate using as neurotransmitters a group of chemicals, called monamines, and acetylcholine. The *monoamines* include norepinephrine, dopamine, serotonin, and histamine. Nerve cells containing these monamines are found in clusters along the brainstem; they send their messages to the forebrain through long branches, or axons, that provide an *arousing input* to the cerebral cortex.

In the other hand, the sleep-active nerve cells in the preoptic area of the brain contain GABA, an inhibitory neurotransmitter which turns down, or dampens, the firing of other cells. When the sleep-active neurons are firing, they profoundly inhibit the arousal systems of the brain, and "turn off the lights."



*“Clarifying your mental”*

As we can understand that it is this system of pathways within the brain and special nerve cells which will directly trigger from deep sleep up to complete wakefulness and in ZZ’s “internal monitoring” which reaches its most sophisticated state where high quality signal (pure signal) from nerve excitation without activating sleep.

Post standing can be applied in medical treatment completing eventually other conventional treatments, providing the patient a comfortable and well being sensation, through physiological changes in human body changing his pathological behavior, curing or at least improving his illness and strengthening his body.

For practitioners in good health with strong physical conditions, more interested in achieving top athletic or martial performance, muscles/nerves need higher level of training until reaching the level where under a slightest touch they can “burst” power without interruption with their whole body.

This second kinetics physical training will improve progressively the cerebral cortex stimulation.

*Develop higher mental functions with Dachengquan*

Scientists have demonstrated that cortical areas are those responsible for interconnecting the various sensory and motor areas by means of association fibers.

They are extremely important for the maintenance and development of higher mental activities of any human being, although it is not possible to localize any specific mental faculty or fraction of conscious experience.

Concerning Dachengquan, in continuation with Wang Xiang Zhai research, we found out that we can illustrate the mental/body development according to two categories:

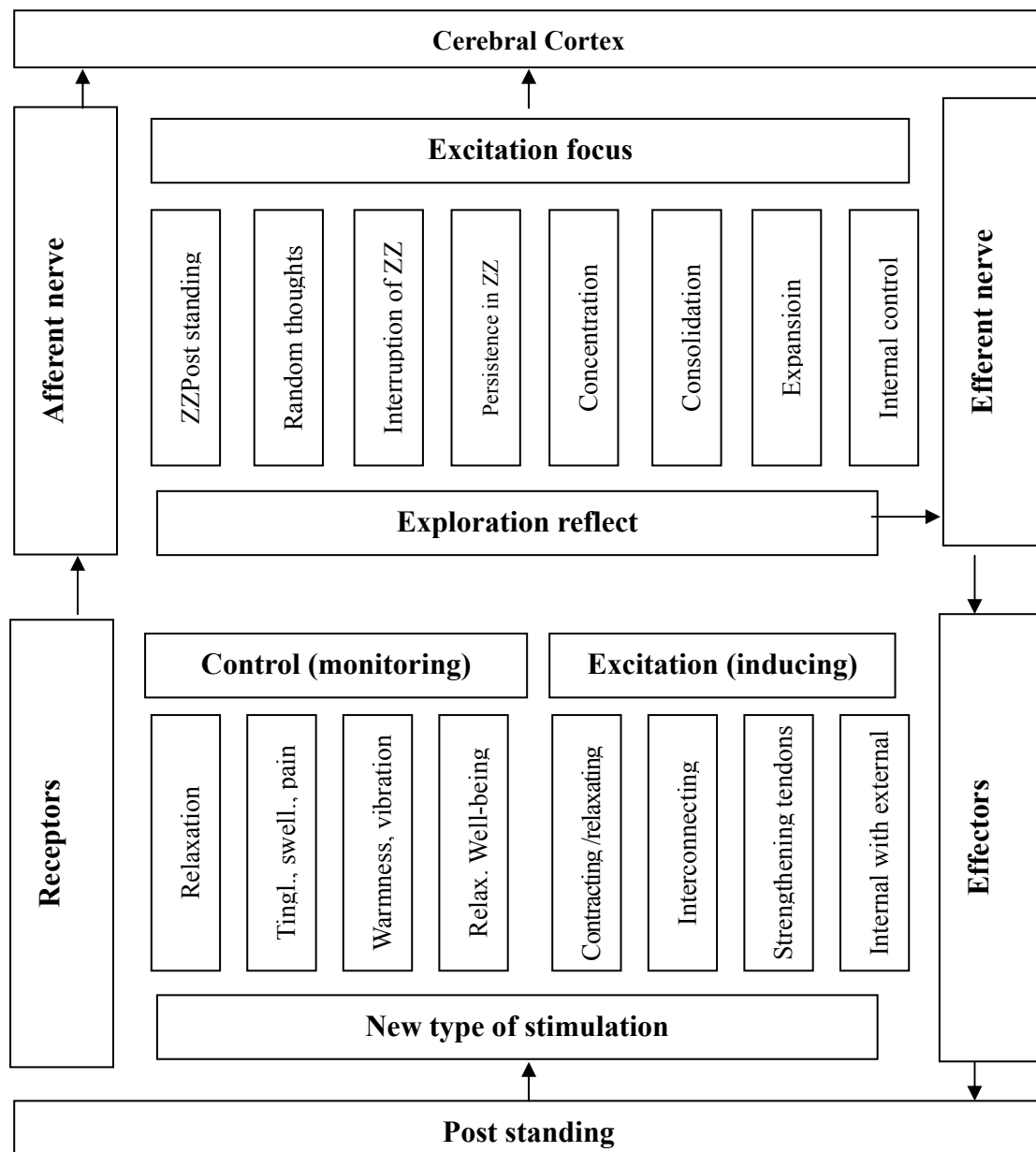
- The first one: Control is the starting state where you will “monitor” sensations inside your body, quite similar to the “Qi” effects,
- The second one: Excitation is a much more explicit state where you will progress from a deeper control of contraction/relaxation process up to highest level where you are like interacting without limits with your environment.

In list 2-1 we have summarized the major steps in both these two categories but also those in the “Exploration reflect”.



Although we are still limited by the actual knowledge of science concerning mental activities but also especially by the insufficiency of researches on this subject, we believe that Dachengquan may be one of the disciplines which can doors to further discoveries of human mental faculties.

**List 2-1 Diagram of functional mechanisms in Zhan Zhuang**





## II.4 Introducing “moving” and “non-moving”

Starting immemorial times until now, physical training for healing has always been separated in two major schools: “moving” and “non-moving”. Which is better? This is a long controversial subject which has been involving numbers of specialists and experts, since the earliest times of healing through physical training.

Among martial artists, there are some who advocate “non-moving in moving”, but adepts of Qigong prefer rather the concept of “moving in non-moving”. But after all what is “non-moving in moving”, what is “moving in non-moving”?

Is there any standard which can define “moving” and “non-moving”? How can you check that, with appropriate training, you’ve reached “non-moving in moving” or “moving in non-moving”?

Now we will discuss about Zhang zhuang as the most representative method of physical training for healing belonging to the “moving in non-moving” group, in comparison for other methods of “non-moving in moving”, we will present a general classification of physical training and then we will go into more detailed analysis.

### *II.4.1 Defining some standards concerning “moving” and “non-moving”*

The appellation of “sport” is an abbreviation for **“moving” physical training** and stillness the abbreviation for **“non-moving” physical training**.

The concept of sport/stillness is relative and should be never consider as absolute.

Another important remark is the limitation of our sensory apparatus. Philosophers have been studying the problem of how we can know the world for thousands of years. Our method of knowing about the world is primarily and perhaps exclusively through out sensory apparatus. The senses of sight, hearing, touch, taste and smell all provide us with information as to what there is in the world. This information, widely called sensations, lets us know the color and shape of things, any sound they may make, how hard or soft things are and what they taste or smell like. They allow us to be aware of





certain qualities of the things in the world. There appears to be no way in which we can find out about the world external to ourselves, other than through our sensory apparatus.

Various disciplines of science such as Physics, Astronomy, Biology, etc...have demonstrated the unreliability of our sensory apparatus.

*Fact 1: Matter is mainly emptiness* – Modern physics proved that matter is made of atoms and each of them is composed of a nucleus surrounded by electrons: in between just emptiness...

*Fact 2: Light's speed* - Without scientific experiments, we will consider light as instantaneous, but although light is traveling with a very high speed, it has been demonstrated that this speed has a limit.

*Fact 3: Earth movement* - As any human being, we live on the planet **Earth** without feeling it moving, but we all know that it is continuously moving, day and night, in a **perpetual self-rotation** around the Sun.

*Fact 4: Plants growth* - Early scientists classified organisms as **Animal** or **Plant**. Let's take this large group of Plants: although plants do not have motor ability as animals, it doesn't restrict the internal activities of their cells. They are constantly expressing this state of "non-moving" internal development: growing and strengthening.

Now it becomes self evident that our own sensorial organs are limiting us in the perception of our surrounding universe and ourselves.

Man is member of the Mammal group of animals. As all animals, he can use his four limbs to move and during this activity, involving physical exertion and skills, is governed by a set of rules or customs, this is a simplistic definition of **Sports**.

In basic classification of sports, are only considered the types of figures, corresponding rules, displacement... but all these parameters are useful to describe the external aspect of the practitioner but nothing about the internal aspect of his body.





Therefore it should be a higher level of classification of physical training where we can integrate the internal and external aspects.

Let's first start with four basic points.

a) The external aspect of moving and non-moving

When the human body is moving (from a place to another) or his limbs are changing postures such as, hand and foot bending and/or stretching, walking, running, jumping, getting up, bowing, rotating, shifting position, climbing etc... actions, all movements generated in these sports are characterized by the forms they produced, they are subjects to be “random movements”. Random movement is the combination of excitation from cerebral cortex and contraction/relaxation of skeleton muscles. When the movements of the four limbs are daily happening, level of excitation in cerebral cortex decrease and the same time muscles are requesting progressively the minimum power to achieve this daily task (such as normal walking for example), while the rest of the body is relatively calm.

This gives you an idea how relative the concept of moving and non-moving is even for a common example of the four limbs of a human body in daily situation.

b) The physiologic aspect of moving and non-moving

In human body physiologic functions are uninterruptedly working day and night to maintain life, to promote blood circulation, general metabolism, digestive and excretive functions, respiration, etc... These internal processes, although not observable with our eyes all are rigorously organized to optimize their tasks.

The sympathetic nervous system (SNS) regulates a number of involuntary physiologic functions through the production of substances called neurochemical transmitters.

Among the body's involuntary physiologic functions, you have for example heart rate, blood pressure or temperature.

Human being at rest, meaning without any external stimulation, has his own physiologic contractions of involuntary muscles.



## Normal resting heart rate

Many factors affect normal heart rate, including your age, activity level, and the time of day. The chart below shows the normal range of a resting heart rate (pulse rate after resting 10 minutes) in beats per minute, according to age. In general, the lower your resting heart rate, the more efficient your heart is and the healthier you are.

Resting heart rate	
Age or fitness level	Beats per minute (bpm)
Babies to age 1:	100–160
Children ages 1 to 10:	60–140
Children age 10+ and adults:	60–100
Well-conditioned athletes:	40–60

## Normal resting respiration rate

The respiration rate is the rate at which a person breathes. It increases with fever and some illnesses. The best time to count the respiration rate is when a person is resting, perhaps after you take the person's pulse while your fingers are still on the person's wrist. The person's breathing is likely to change if he or she knows you are counting it.

Resting respiration rate	
Age	Breaths per minute (bpm)
Babies to age 1:	40–60
Children ages 1 to 6:	18–26
Children age 7+ and adults:	12–24



## Normal resting temperature

The normal temperature varies by person, age, time of day, and where on the body the temperature was taken. The average normal body temperature is 98.6°F (37°C).

Your body temperature is usually highest in the evening. It can be raised by physical activity, strong emotion, eating, heavy clothing, medications, high room temperature, and high humidity.

Daily temperature variations	
Age	Temperature degree
Babies up to six months:	small
Six months to 2 years:	1
Children age 6	2
Adults	less
Woman in menstrual cycle	1+

## Resting metabolic expenditure rate

Resting Metabolic Rate (RMR) refers to the amount of calories required to maintain bodily functions.

Resting metabolic rate accounts for 60-75% of the calories individuals' burn. RMR is the sum of all metabolic processes that maintain normal body functions. A typical RMR for males is 1500-1800 calories a day and 1300-1600 for females. There are many factors that influence resting metabolic rate. Body weight is the most obvious one. A person with more body weight will have a higher RMR than a smaller one because their body needs more energy to support and sustain the extra weight.

This is show that even without any external stimulation such as



sound, light and being in a very quiet environment, human body does not reach an absolute stillness as his involuntary physiologic functions continue. After physical effort or during sleeping, there is still a minimum quantity of energy burnt inside your body: the resting metabolic rate.

Now once the body passing from a resting state to state which requires movements, displacement... involving physical effort, as a result pulse and respiration rate are increasing: we are in the moving state.

c) Cerebral cortex during moving/non-moving states

The cerebral cortex is the biggest part of the brain. This large and complicated neural circuit is involved in most of the brain's highest functions, such as memory, language and sight.

The cerebral cortex contains two types of nerve cells excitatory or inhibitory. Each neuron, a nerve cell in the brain communicates with other neurons through chemical connections that fire off a tiny bit of chemical that either inhibits or excites the next neuron. These connections between neurons are called synapses.

Within each type of excitatory or inhibitory cell, circuitry keeps neurons interconnected and communicating to keep overall brain activity in balance.

We can define two extreme situations. Too much excitation and too little inhibition, for example, may lead to seizures (type of focal epilepsy). The opposite may lead to a loss of consciousness, coma or death.

Now back to the moving/non-moving state, I define moving state: when, in physical exertion, excitation of cerebral cortex involves higher mental functions such as hearing, vision...

In the opposite, if during physical exertion, these higher mental functions are not required, where the brain is not monitoring how to settle one movement to another, I call it “non-moving state”.

d) Moving/non-moving integration

There are two ways to integrate moving and non-moving physical



training:

- ◆ Anterior/posterior method,
- ◆ Simultaneous method.

#### *Anterior/posterior method*

In this method you are first practicing the “moving” techniques then the “non-moving” techniques or inversely by starting with “non-moving” and later change to “moving”.

To put it simple, you are alternating one category of physical training with the other.

#### *Simultaneous method*

In this method you are combining moving and non-moving in the same time.

To apply this method you need to hold your stance in a fixed posture and fixed angle, then from this apparent immobility (muscles and mind) you are setting up your preconditions of stillness. Due to the angle effect, tendons, bones and muscles are incessantly required, increasing progressively physiologic functions. Heart rate is increasing with a same and durative rate while breathing is not in the way to reach suffocation.

Holding your post will reduce your nerve system excitation especially reducing to its minimum level signals which are normally constantly activated such as for maintaining balance or monitoring your environment for security purpose: vision and hearing for example may have less signal to activate the cerebral cortex, improving your ability to reach and preserve stillness.

#### e) Physical training classification

Human body in lying, sitting and standing position is normally using the minimum muscular tension to maintain the posture without exerting powerful cycles of contraction/relaxation, under these conditions pulse rate keeps steady, as well as respiration rate, you are in break-even point in terms of balancing involuntary physiological functions.

You can normally reach this state relatively easily under situation of quietness.

But in daily life, at the office, or any place elsewhere... it is impossible to keep this state after a certain time. As soon as displacement of body or movements are requested from your body with more or less amount of physical effort, it will impact



immediately your physiologic functions and you can verify it through your pulse or your heart rates.

We can classify then all physical training whatever their special physical requirements and/or impacts on physiologic functions into two large categories: the first one is the “moving” physical training (exertion) and the second is the non-moving Physical training (exertion). See List 2-2.

**List 2-2 Physical training classification**

<b>P.T. classes</b>	<b>Moving</b>		<b>Non-moving</b>	
<b>Principles</b>	<b>Low end phys. exercise Minimum threshold</b>	<b>Moving without non Higher threshold</b>	<b>Only non-moving</b>	<b>Moving and non-moving unified</b>
<b>Moving/non- moving relationship</b>	<b>out: moving in: non mov.</b>	<b>out: moving in: moving</b>	<b>out: non mv. in: non mv.</b>	<b>out: non-moving in: moving</b>
<b>Pulse change</b>	<b>normal</b>	<b>increased</b>	<b>reduced</b>	<b>increased</b>
<b>Breathe change</b>	<b>normal</b>	<b>difficult</b>	<b>reduced</b>	<b>strengthened</b>
<b>Mental change</b>	<b>stimulated</b>	<b>stimulated</b>	<b>controlled</b>	<b>controlled &amp; stimulated</b>

### *Moving physical exercise*

In this type of physical exercises, limbs are continuously changing posture, chaining from one to another and where movements will define the performances in this physical exercise. It requires the highest concentration of mental, mobilizing internal and external organs/sensors functions, particularly vision and hearing, while paying constantly attention to the external environment and its possible changes, how to chain with the following movement, etc.. all these inputs will contribute to increase excitation in the cerebral cortex.

Physical exercises involving movements of limbs are belonging to the same category.



They are called also “instinctive” and constitute the category of “animal physical exercise”.

Here are two kinds of “animal physical exercise”:

### (1) Low end physical exercises

From a normal physiologic state, human body will request some muscles to contract violently, bringing heart rate to increase too: the total amount of physical effort achieved with all muscle fibers involved gives a reference while comparing different practitioners taking account of the intensity of contraction and its duration.

So the minimum value of physical effort where the heart rate will start to increase from a relatively normal value is called “Physical exercise threshold value”. It is quite evident that this value is related to the physical conditions of the practitioner.

In low end physical exercises it is rather a Minimum threshold value and, while limbs or body are incessantly changing from one posture to another, this will not cause very obvious changes in physiologic functions.

For example hand slowly bending and extending, walking in a slow pace, four limbs’ joints moving in a low speed, involving very small power and within a short time.. all these physical exercises will almost not affect your heart/respiration rate or even not at all: this is the reason they are called “Low end physical exercises”.

Again it would be too restrictive to define physical exercises versus resting state with only the reference of changes in limbs or body postures. A more scientific way to consider this problem is to consider various physiologic functions comparatively in resting state and during physical exercises such as breathing/heart rates, metabolism, cerebral cortex excitation, etc...In other words your limbs may change postures but it may not affect your pulse rate: “low end physical exercises” cannot be considered as “physiologic exercises”. This state can be defined external moving/internal non-moving, non-moving during moving, or external dynamic physical exercises...

### (2) Moving physical exercises without stillness

If during physical exercises, main physiologic functions such



as the pulse is suddenly increasing while another main physiologic function such as breath can't satisfy the body's requests in term of oxygen's supply, this can be defined as the inability of the body to manage and reinforce the physiologic demands: this will lead to a state of suffocation for example. And immediately after the physical exercise, it may cause for example too large expansion of the heart's right auricle, breathing irregular and accelerated, palpitation, change in the color of face, etc...

All these consequences can be qualified as "moving without stillness". In this case due to the large demand of physical effort requested, internal physiologic functions are immediately reacting but this time in quite unstabilized way: Acceleration of breathing/heart rate, brain signal overstimulated...

Now it becomes evident that in this type of physical efforts the modification of physiological changes is less stabilized and controlled with the increase of physical effort.

This class refers to physical exercises requesting fast movements with limbs, violent changes in the body but also *Biequi* (holding breath).

### (3) Main physiologic changes in moving physical exercises

During muscle contraction, heart rate has a more balanced increase if the quantity of oxygen intake from breathing is higher than the quantity consumed. If there is in the contrary a lack in oxygen supply, it will trigger the physiologic oxygen shortage metabolism function: irregular breathing and inhibition of muscles contraction process.

Muscles contraction/relaxation process cannot continue as well as in normal state anymore, as the lack of oxygen and the surplus of carbon dioxide is not more and more obvious.

We can conclude that moving physical exercises are involving the normal power development during the exercise and in this way you cannot really avoid the final state of suffocation intervening when reaching its high threshold point.

From the increase speed of your movements, the amount of power involved in each movement, the duration of your physical effort, your oxygen consumption will also increase so that you reach faster the suffocation state.





Moving physical exercises bring a complete change in the physiologic functions especially due to the lack of oxygen once reaching suffocation; they are mainly concentrated on the skeleton muscles performance to the detriment of respiration system.

For example a 100 meter sprinter after only about 10-second race, reaches around 80%-90% oxygen debt. This oxygen debt requires a certain resting time to the athlete to recover completely: around 30 to 40 minutes.

After a intensive physical effort, young and strong athletes can bear acceleration of heart rate up to 200 bpm.

But in the case of older and/or weaker people, such oxygen debt/heart rate acceleration are no more bearable as it was for an athlete.

This is the reason why conventional medicine does not advise patients to take much physical training but rather much rest and sometimes even no physical exercise at all.

But we started to understand that there is another group of physical exercises which do not represent the same disadvantages regarding physiologic functions change.

### *Non-moving physical exercise*

In non-moving physical exercise, we are in a complete opposite situation with moving one.

There is no apparent movement from the limbs while they are holding their posture with the fixed bending angles. During this time first we don't need to focus our attention to sensorial organs such as vision or hearing to follow environment changes, we don't need also to think and prepare the next posture to be linked with...that means reduction of signals in your cerebral cortex, simplification of the analysis and integration process in it, therefore you mental internal monitoring is much improved.

In the same time as limbs are not moving, you are not approaching the state of suffocation nor having oxygen debt.

We have in non-moving physical exercise the double balanced effect of strengthening the body (muscles) while improving physiologic functions.

This is similar to “a tree standing, unmoving but growing and



developing continuously”. For this reason it can be called “vegetal physical exercises”.

Here are the two sub categories of “vegetal physical exercises”:

#### (1) Non-moving exercise without physical exertion

In practicing this exercise your main physiologic functions should be reducing compared with the situation before practicing the exercise.

Let’s say you, before starting your training you have 74 bpm heart rate and 19 bpm respiration rate, then after training your heart rate will drop down to 69 bpm and respiration rate to 10 bpm.

But here again physiologic functions changes may vary from one person to another.

Non-moving exercise without physical exertion does not mean absolutely no physical exertion. The tranquility state is achieved through deep relaxation of four limbs’ muscles, trying your best to relax in other parts of the body. As the amount of power developed is much reduced, physiologic functions are not running away as in pure physical exertion, they are rather calming down, reaching a level lower than when you started the training.

It is a state of external and internal stillness.

This kind of exercise may achieve after a certain time of practice, a better control of signal excitation in cerebral cortex and even able to cure some chronic diseases in some cases.

But often later after a certain time, the body will present less signs of improvement as this method cannot adjust the level of physical effort (and especially influence the physiologic functions): curative effects and general physical condition improvement will progressively disappear.

For example, some exercises may present very obvious effects almost as you start practicing them up to 3-6 months then the effects are progressively fading ...

#### (2) Non-moving/moving with physical exertion

Non-moving with moving physical exertion can be called “stillness in moving” or “moving in tranquility”, in any case the involuntary physiologic functions should be: constant increase of pulse rate, steady breathing and mental



control/monitoring.

These three functions being intimately related and cannot be considered separately.

Here physical exertion is related to the contraction of skeleton muscles which effects are the increase of involuntary physiologic functions such as heart rate acceleration. In case there is not heart rate increase we cannot consider this exercise as physiologically “moving”.

Non-moving is the way to keep a steady breathing and cerebral cortex in tranquility state. These aspects cannot also be considered separately.

Nota: Moving exercises without reaching tranquility state (pulse increase but still irregular breathing, brain overstimulated) or no moving exercise without reaching physical exertion ( smooth breathing, mental monitoring but not pulse increase), both cases cannot be considered as non-moving/moving with physical exertion exercise.

How can you reach “moving in tranquility”?

First you need to reduce or evade completely from external stimulation brought by your sensorial organs.

For example your vision is no more observing environment changes and for this you need to stay in the same place.

Now we need to increase heart rate to induce physiologic changes but instead of choosing the normal physical exertion (moving exercise with higher power, faster speed but leading to suffocation and overstimulation of cerebral cortex) you choose the non-moving exercise.

Your shoulders, back, chest, etc... remain relaxed, respiration is increased progressively without precipitation, so that you avoid any situation of suffocation/oxygen debt.

Zhan zhuang is precisely this non-moving exercise.

In ZZ you don't need to worry about your environment or think about your next move...

So your brain can reach deeper stillness or at least better internal monitoring.

We should also precise that during non-moving exercise, it is important to keep physiologic functions still in activation otherwise you are coming back to a situation of complete rest or even sleeping.

Until now we presented ZZ as an efficient physical treatment



for patients, helping them to get rapidly more control in the nerve excitation process. But this is not its unique advantage, the other one concern athletic sports where it helps to reach highest level of brain excitation during athletic performance. This mental ability is currently trained in ZZ through “mental activity” during contraction/relaxation cycles.

So we can say that non-moving physical exercise can induce two situations in complete opposition, one is more conservative restraining and controlling nerve signal and the other bringing it to its higher level.

This last advantage of ZZ makes the complete difference with other physical exercises without mentioning others sports...

### 3) Major physiologic changes in non-moving physical exercise

Physiologic changes appearing during non-moving exercises are differing completely with moving ones.

During the non-moving exercise, although heart rate is growing up, the increase is steady and can be maintained even during a certain time, but also very important fact is that the respiration rate is never irregular so that suffocation/oxygen debt is avoid, no surplus of carbon dioxide, in a word all internal metabolism is running harmoniously well and adapting hand in hand with the physical effort.

How come the body can reach this high level of compensation in front of growing physical demands? We explain it as the harmony in the mental and the *Qi*.

#### *Breathing enhancement*

With practice, practitioner of ZZ will not feel any premise of suffocation/oxygen debt rather a surplus of oxygen.

His breathing will be deeper and slower. ZZ can be considered as promoting oxygenation metabolism (in opposition with suffocation/oxygen debt process generated by moving exercises).

Non-moving exercise requires immobility from limbs: no bending, extension or displacement from them, then all is in the internal contraction of muscle fibers.

#### *Thigh muscles*



The thigh has three sets of strong muscles: the hamstring muscles in the back, the quadriceps muscles in the front, and the adductor muscles on the inside. The quadriceps and hamstring muscle sets work together to straighten (extend) and bend (flex) the leg. The adductor muscles pull the legs together.

By maintaining the muscle at a specific length by using an isometric exercise, the muscles will develop a fast twitch response.

This means, first, that the nerves and muscles develop the memory to accelerate instantly to the contraction point of the isometric exercise, and secondly, the fast twitch muscle fibers are conditioned to maximize the speed of the muscle contraction.

**By strengthening the fast twitch muscle fibers, you have increased the speed at which the muscles contract or move.**

**When this application is applied to your thigh flexor and extensor muscles, for example, the result is an explosive increase in your running/kicking speed and power!**

To verify this just hold a very low ZZ and feel with your hands the tremors in your thighs you are generating after a certain period of standing: there is a high frequency of contraction, much higher than in any sport you may use them.

#### *The principle*

The same principle holds true for **increasing the speed and power of any muscles that are critical to quickness and power in any sport specific activity.**

Wang Xiangzhai summarized this principle in his famous saying:

*“Large moves are not as good as small moves,  
small moves are not as good as squirms,  
non-moving activation is stillness in moving,  
moving in stillness,  
(generating) endless movements.”*



In a word, this principle is still in the discovery stage, the physiologic changes that it can induce give us the idea of how vast can be the range of its applications.

To go further in study and research this will require complete scientific programs fully equipped with the most updated instruments to monitor these physiologic changes during ZZ training.

We give in List 2-3 our latest results in analyzing physiologic similarities/differences between moving and non-moving physical exercises.



**List 2-3**  
**Similarities and differences between**  
**moving and non-moving physical exercise**

<b>Phases</b>	<b>During exercise</b>		<b>After exercise</b>	
<b>Type of exercise</b>	<b>Moving</b>	<b>Non-moving</b>	<b>Moving</b>	<b>Non-moving</b>
<b>Shoulder/back muscle</b>	<b>contracted</b>	<b>relaxed</b>	<b>sudd. relaxed</b>	<b>relaxed</b>
<b>Glottis</b>	<b>obstructed</b>	<b>opened</b>	<b>sudd. opened</b>	<b>opened</b>
<b>Chest inner pressure</b>	<b>sudd. increased</b>	<b>normal</b>	<b>sudd. reduced</b>	<b>normal</b>
<b>Belly inner pressure</b>	<b>sudd. increased</b>	<b>normal</b>	<b>sudd. reduced</b>	<b>normal</b>
<b>External resistance</b>	<b>sudd. increased</b>	<b>increased &amp; reduced</b>	<b>sudd. reduced</b>	<b>normal</b>
<b>Small blood vessel</b>	<b>pressured then contracted</b>	<b>pressured &amp; enlarged</b>	<b>sudd. dilated</b>	<b>normal</b>
<b>Respiration</b>	<b>-</b>	<b>natural</b>	<b>fast &amp; irreg.</b>	<b>natural</b>
<b>Pulse</b>	<b>+</b>	<b>+</b>	<b>1<sup>st</sup> sudd. increased then decreased</b>	<b>moderate increase then decr.</b>
<b>Body circulation</b>	<b>extravasated</b>	<b>accelerated</b>	<b>lack of blood</b>	<b>normal</b>
<b>Lung circulation</b>	<b>lack of blood</b>	<b>accelerated</b>	<b>congested</b>	<b>normal</b>
<b>Heart</b>	<b>lack of blood</b>	<b>normal</b>	<b>sudd. enlarged</b>	<b>normal</b>
<b>Related metabolism</b>	<b>oxygen shortage metabolism</b>	<b>suroxygenation metabolism</b>	<b>excitement metabolism</b>	<b>normal</b>
<b>Face color</b>	<b>flushed and venous swelling</b>	<b>normal</b>	<b>pale</b>	<b>normal</b>





## II.5 Physiologic characteristics of Zhan zhuang

### *II.5.1 Introduction*

When you practice ZZ as you are performing your physical training, various organs and vital systems such as circulatory system, respiration system, endocrine system, perspiration system, excretory systems, etc...all are stimulated by this exercise.

#### *Blood vessels*

Let's start first with heart/circulatory system: through ZZ heart's vessel system is enhanced, consolidating its distribution, from bowels up to muscles.

At resting, muscles present only small capillary vessel dilation, once practicing ZZ a large number of even smaller capillary vessels are dilated and contribute now also to the general circulation in the body. When you feel, during your ZZ, fingers like swelling and heavy, skin of lower limbs like congested, this is simply effect of capillary vessels dilation and improvement of blood circulation.

After post standing eyeground's capillary vessel becomes thicker, in our research we found that they can even triple. Through a moderate physical effort, you can hold your post standing longer, then capillary vessels has the time also to dilate more, external resistance around vessels is reduced through correct alignment, therefore increasing blood supply and finally reducing directly pressure around the heart.

#### *Breathing*

In post standing, there is also an important change intervening in the respiration system, especially in conveying more oxygen to muscle tissue.

During this exercise muscle oxidation (releasing food energy) may reach up to twofold increase and oxygen consumption up to fourfold. In the same time, metabolic wastes (carbon dioxide, lactic acid) are also increasing and signal the respiratory centers in your brain, which, in turn, stimulate the respiratory muscles, telling them to work harder. With practice this stimulation will be reduced as the muscle will be able to accept more oxygen during a same respiration cycle. Your breath is then deeper and your blood more enriched by oxygen.

As in ZZ you are always free of any suffocation, there is no risk to happen any oxygen debt in your respiratory system so that during and



after your training you will maintain stable physiologic functions.

### *Eliminate heat*

In ZZ as well as any physical exercises, your working muscles will generate heat. As your temperature rises, the sympathetic nervous system stimulates certain glands in the body, the eccrine sweat glands, to secrete water to the skin surface, where it cools the body by evaporation. Sweat is like your very own air conditioner. As sweat evaporates from the skin, it is removing heat and cooling the body. It's also removing fluid from your body, so it's very important to replace those lost fluids. In ZZ the excretory function with the eccrine glands, all are much stimulated due to the special exercising of your working muscles then all metabolic waste are expelled very rapidly out of your body.

In the same time digestive function is improved so that whole body can allocate more energy to physical activities.

As ZZ has a direct influence on the regulation of the Central Nervous System: no movements with four limbs gives, excitation in cerebral cortex are now reduced to control and to keep your posture, into an active state of resting: it is precisely with this high level of signal monitoring/resting state that will help patients to recover and reactivate their natural functions of immunization

## *II.5.2 Core concept of breathing*

### *Oxidation- Why oxygen is so important!*

To introduce to importance of breathing we presented previously the natural process in gas exchange between oxygen and carbon dioxide in breathing.

Now to go a step ahead, let's remind that oxidation is the primary process used by the body to gain energy. When we eat healthy food our body uses oxygen and a process called oxidative phosphorylation to turn the food into energy. The body uses oxygen not only to produce energy but also to oxidize invading bacteria, viruses, fungi, toxins, and other harmful organisms and chemicals, to keep our bodies healthy.

### *Mechanical work of breathing & various types of breathing*

Mechanical work of breathing derived from rib cage and abdominal



volume-pressure partitions.

According to chest structure and thoracic movements you can adopt various ways of breathing: diaphragmatic, intercostal, and clavicular.

- **Diaphragmatic breathing**

The majority of men breathe in this way. The diaphragm subsides while the breath is drawn in, and the abdominal region swells. This is the least faulty method of breathing. The base of the lungs fills with air, and the rhythmic lowering of the diaphragm produces a constant, gentle massage of the whole abdominal content, and helps these organs to function correctly.

- **Intercostal breathing**

This is achieved by raising the ribs through dilating the thoracic cage or chest wall like a pair of bellows. It is a form of breathing which fills the middle section of the lungs, allowing less air to enter than the abdominal respiration, and more important, involving far more effort! This is 'athletic' respiration. When combined with abdominal breathing it ventilates the lungs satisfactorily.

- **Clavicular breathing**

Air is introduced by raising the collar-bone and shoulders. In this way, only the upper part of the lungs receives any fresh air. It is the least satisfactory method of breathing and is often characteristic of women.

- **Complete breathing**

Complete respiration (same then in yoga) incorporates all three methods, integrated into one single, full and rhythmic movement.

Breathing frequency is related with one's age, sex, body's posture but also external factor such as outside temperature and altitude.

Adults have a respiration rate about 1/4 of heart rate, generally between 12 to 18 bps.

*Age:* Respiration rate (RR) is changing with the age: a newborn baby's RR is around 60 bpm, at 5 it decreases to 25 bpm, then at 15 it reaches the normal adult rate of 12 to 18 bpm.

*Sex:* Woman's RR is normally faster than man's RR, in average 1 or 2 bpm more than men.

*Posture:* When someone is lying his RR is less than his RR in standing.

*Sleeping:* In sleeping due to the reduction of metabolism, the RR is less than in awake state.

*Emotion- physical exercise:* When a muscle is contracting to perform a physical exercise or under emotion, RR follows the increase of heart rate.



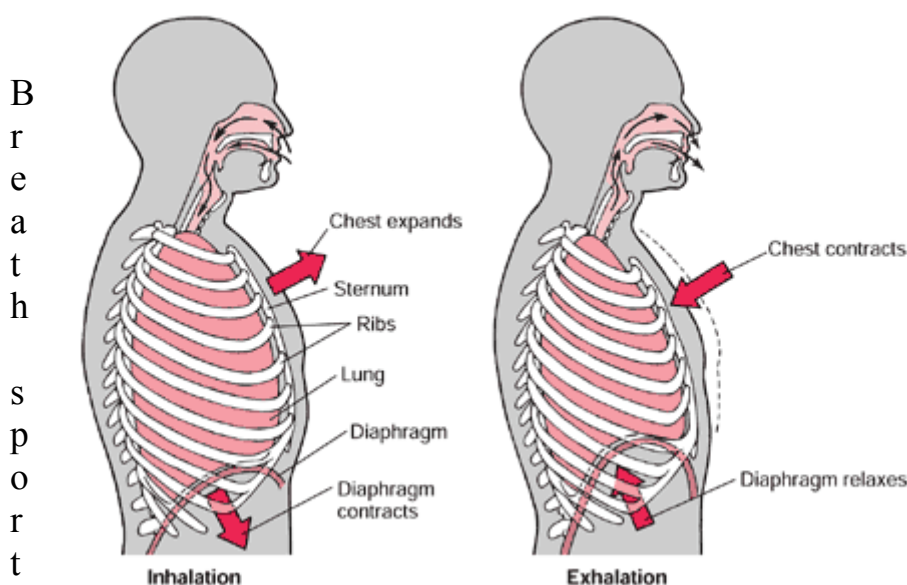
Depending of the type of physical exercise, the speed of movements, duration of the exercise, power requested, etc... RR may also vary according to each one's body.

So RR is also a very good indicator to estimate the health of patient and the level of practice.

### (1) Breathing control

Breathing is usually automatic, controlled subconsciously by the respiratory center at the base of the brain. Breathing continues during sleep and usually even when the person is unconscious. Small sensory organs in the brain and in the aorta and carotid arteries monitor the blood and sense when oxygen levels are too low or carbon dioxide levels are too high. In healthy people, an increased concentration of carbon dioxide is the strongest stimulus to breathe more deeply and more quickly. Conversely, when the carbon dioxide concentration in the blood is low, breathing is reduced. Then, the brain decreases the frequency and size of breaths.

### Diaphragm's Role in Breathing



When the diaphragm contracts, the chest cavity enlarges, reducing the pressure inside. To equalize the pressure, air rushes into the lungs. When the diaphragm relaxes, the elasticity of the lungs and chest wall pushes air out of the lungs.

Because the lungs have no skeletal muscles of their own, the work of breathing is done by the diaphragm, the muscles between the



ribs (intercostal muscles), the muscles in the neck, and the abdominal muscles. The diaphragm, a bell-shaped sheet of muscle that separates the lungs from the abdomen, is the most important muscle used for breathing in (called inhalation or inspiration). The diaphragm is attached to the base of the sternum, the lower parts of the rib cage, and the spine. When the diaphragm contracts, it increases the length and diameter of the chest cavity and thus expands the lungs. The intercostal muscles help move the rib cage and thus assist in breathing. All the muscles used in breathing contract only if the nerves connecting them to the brain are intact. In some neck and back injuries, the spinal cord can be severed, and the person will die unless he is artificially ventilated.

### **Pulmonary Ventilation**

An important notion to introduce is the Pulmonary Ventilation (VE), it is defined as the amount of air breathed per breath.

$VE = \text{Breath rate (RR)} \times \text{Tidal Volume (TV)}$ ,

VE is measured in liter of air per minute

TV = amount of air breathed per breath

Normal TV = 500ml (1/2 liter)

VE = 6 l/min (at rest)

Increasing either (or both) TV or (and) RR can increase VE (as with exercise)

Max VE can be increased 20-25 fold = 120-150 l/m

How does our body know how much breathing it needs to do?

What factors control the rate and depth of ventilation?

Control lies within an area of the medulla called  
the RCC = **Respiratory Control Center**

### *RCC*

The RCC acts as a coordinating area which receives information (both centrally and peripherally) and then sends signals to the respiratory muscles to control breathing. (VE)

It receives chemical, neural, mechanical and thermal information.

The respiratory muscles receive information only from the RCC.

### *RCC Information*



Peripheral Receptors include:

- Chemo-receptors (Humoral) PO<sub>2</sub>, PCO<sub>2</sub>, pH found in the arteries, and lungs (alveoli).
- Stretch/Proprioceptive/Mechano-receptors (neural) found in the lungs and muscles.

Central Receptors include:

- Temperature & Chemical (blood) in the RCC.
- Motor cortex input (Higher brain activity), signals to the muscles pass through the RCC first.

We can say that it is normally not possible to take complete control of your breathing.

Breathing is an involuntary action under control of the Medulla Oblongata in the lower part of the brain. Sensory neurons in this region control motors neurons in the spinal cord.

A simple example is how long you can hold your breath.

Although you can consciously controlled breathing to a limited extent- such as holding your breath – it cannot be consciously suppressed. The need to supply oxygen to our cells and remove carbon dioxide is a powerful one.

Finally you can only hold your breath until you lose consciousness – then the brain takes control and normal breathing resumes...

Respiratory system is closely related to other vital functions of the body, as an example respiratory and circulatory systems have closely related jobs. The work of these two systems is sometimes referred to together as the *cardiorespiratory system*.

But you have also all kinds of signals form RCC which can influence breathing such as external temperature.

## (2) Breathing during Zhang zhuang

In ZZ your breathing should be mainly be comfortable and natural.

First you should be able to appreciate the results of your practice, without bothering how you are breathing, curative effects are not directly related to the consciously form of breathing you could choose. In a word do not pursuit consciously the control of your breathing or you may fall into unpleasant side effects.

In ZZ both hands and both elbows are requested to change from their normal *dropping posture*: dropping alongside the body, into a *lifting posture*, while maintaining always relaxed muscles of





shoulders, back and upper thorax, and keep the posture. Under these postural conditions intercostal muscles (muscles between ribs) are released from their previous tension, allowing more amplitude in the breathing movement of your ribs: this time you have more air entering the base of the lungs for abdominal breathing.

Now we understand that ZZ allows you naturally to reach abdominal and intercostal breathing, and I repeat, without controlling consciously your way of breathing.

A further step in ZZ will come with an effective relaxation of the shoulders and upper part of the body (especially collar-bone area) you reach now the complete breathing as described previously.

Let's revise the situation: breathing is automatically set up and adjust through RCC to answer to the needs of internal organs as well as demands of physical efforts.

#### *Nose breathing during ZZ*

Always better whenever possible (deviated septum and small nostrils may make it impractical but still nose breathing 24 hours a day is extremely important for those who desire the longest and most healthy life.

Here are 10 reasons why it is so important to keep using nose breathing especially during ZZ exercise.

1. The lungs are a primary control of our energy level. They extract oxygen from the air we breathe primarily on the exhale. Because the nostrils are smaller than the mouth, air exhaled through the nose creates back pressure when one exhales. It slows the air escape so the lungs have more time to extract oxygen from them. When there is proper oxygen-carbon dioxide exchange, the blood will maintain a balanced pH. If carbon dioxide is lost too quickly, as in mouth breathing, oxygen absorption is decreased.

2. Afferent stimuli from the nerves that regulate breathing are in the nasal passages. The inhaled air passing through the nasal mucosa carries the stimuli to the reflex nerves that control breathing. Mouth breathing bypasses the nasal mucosa and makes regular breathing difficult. During sleep, it predisposes one to loud snoring and irregular breathing and can lead to a serious condition called *Sleep Apnea* and heart conditions.





3. Also, when mouth breathing, the brain thinks carbon dioxide is being lost too quickly and sensing this, will stimulate the goblet cells to produce mucous, slow the breathing and cause constriction of blood vessels. Breathing through the nose also limits air intake and forces one to SLOW down. Proper nose breathing reduces hypertension and stress for most people. Kind of like a speed control (governor) on a car engine.

4. The nostrils and sinuses filter and warm the air going into the lungs. The mouth breather bypasses this. The sinuses produce nitric oxide (NO) which is a pollutant but harmful to bacteria in small doses. Mouth breathing also accelerates water loss increasing possible dehydration.

5. Each nostril is innervated by five cranial nerves from a different side of the brain. Each nostril functions independently and synergistically in filtering, warming, moisturizing, dehumidifying, and smelling the air.

6. Maintaining a keen sense of smell is very important for enjoying life and for safety and social acceptance. Think of all the beautiful smells we enjoy with our nose.

7. Upper Airway Resistance Syndrome, the new medical description for what most of us call snoring, is a problem for about 90 million Americans everyday. Socially unacceptable snoring occurs when other people complain about the noise. They are irritated by the snoring noise because they were unable to sleep well in the same room and in some cases the same building. Snoring is a major social problem. It can also lead to major medical problems if snoring and mouth breathing combine to cause irregular breathing during sleep.

8. What you do during waking hours carries over into sleep. Any opportunity for **mouth breathing** inhaling or exhaling will increase the chances of mouth breathing during sleep. Hospital studies have established that nocturnal mouth breathing is a primary cause of loud snoring. Snoring is precursor to sleep apnea and apnea a precursor to heart attacks and dying in one's sleep.

9. Nose breathing imposes approximately 50 percent more resistance to the air stream in normal individuals than does mouth



breathing, resulting in 10-20 percent more O<sub>2</sub> uptake. There must be adequate nasal resistance to maintain adequate elasticity of the lungs.

10. Breathing through the mouth with the nose obstructed usually imposes too little resistance and can lead to micro-areas of poor ventilation in the lungs (atelectasis). Many years of breathing against excessive resistance as with nasal obstruction, may cause micro areas of poor ventilation (emphysema).

### *(3) Effects of ZZ on breathing system*

ZZ is inducing a very important change in the structure and the function of the breathing system.

First in strengthening the diaphragm, the muscles between the ribs (intercostal muscles) in their contraction and relaxation abilities, helping the chest to develop, increasing your lungs capacity so that your Pulmonary Ventilation (VE) will also increase while your RR will be slower...sign of general improvement of your respiratory system.

Generally when you are just starting ZZ training, you will experiment an increase of RR sometimes mixed with a deeper breath and a slight feeling of suffocation.

This is primarily due to the adaptation phase with the new posture imposed by ZZ: groups muscles of shoulders, back, chest, etc... can still, hardly reach a sufficient level of relaxation, your lungs capacity is also still restricted so that your VE is still not increasing and you are reaching a RR of around 20 to 30 bpm.

After sufficient time of practice, you will notice progressively that your RR is decreasing down to 10 to 15 bpm.

Now your lungs capacity has increased substantially, diaphragm and intercostals muscles are freely contracting/relaxing, breathing movements involve more obvious movements from the lower parts of the rib cage and more swelling from the abdomen.

To reach this improvement, here are again the preliminary postural conditions of ZZ:

- head like suspended from the top,
- eyes looking forward,
- both hands lifted,



- both elbows expanding,
- shoulders and back relaxed,
- do not apply force,
- reduce power in shoulders and arms to reduce chest pressure,
- expand your lungs,
- increase your Pulmonary Ventilation (VE).

We already explained that ZZ will not lead to suffocation avoiding the post effects of glottis enlargement and thorax internal pressure increase, but in addition ZZ helps airway smooth muscles to remain relaxed while the entire respiration tract allows more air to be exchanged with lungs, down to each alveolus for better ventilation.

Larger supply of oxygen will facilitate the process of oxidation in body's cells, expelling harmful organisms and chemicals from them.

Here are some symptoms of possible oxygen deficiency and where ZZ can have direct effects through better oxygen supply:

- overall body weakness
- fatigue
- circulation problems
- poor digestion
- muscle aches and pains
- dizziness
- depression
- memory loss
- irrational behavior
- irritability
- acid stomach
- lung problems
- increased unhealthy bacteria, germs, viruses and parasites
- Finally almost any illness is created or worsened by lowered oxygen supply.

### *II.5.3 Core concept of heart rate (or pulse rate)*

Pulse is an alternate expansion and contraction of artery walls as heart action varies blood volume within the arteries. Artery walls are elastic. Hence they become distended by increased blood volume during systole, or contraction of the heart. During diastole, or relaxation of



the heart, blood volume in the arteries decreases and the walls contract, propelling the blood farther along the arterial pathway. The effect is that of a pressure wave initiated by the heartbeat and traveling from the aorta, the major artery leaving the heart, along the walls of all the other arteries. It takes about a quarter of a second for this wave to travel from the aorta to the arteries in the soles of the feet. The rate of heartbeat is equivalent to the pulse rate. Usually the pulse rate is determined by counting the pulsations per minute in the radial artery at the wrist. It may also be determined at any other artery point near the surface of the body.

HR is a one of the most important indicators of overall health.

### **Normal resting heart rate (HR)**

Many factors affect normal heart rate, including your age, activity level, and the time of day. The chart below shows the normal range of a resting heart rate (pulse rate after resting 10 minutes) in beats per minute, according to age. In general, the lower your resting heart rate, the more efficient your heart is and the healthier you are.

<b>Resting heart rate</b>	
<b>Age or fitness level</b>	<b>Beats per minute (bpm)</b>
Babies to age 1:	100–160
Children ages 1 to 10:	60–140
Children age 10+ and adults:	60–100
Well-conditioned athletes:	40–60

As we can see on the previous table, after adequate physical training the contraction ability of cardiac muscles may be improved so that pulse rate may decrease to 60 bpm, the lowest rates being around 45 to 50 bpm.

In fact the enhancement goes beyond the cardiac muscles, the number and size of your blood vessels actually increase, and you step up your lung capacity and respiratory rate, and your heart increases in size and strength so you can exercise longer before becoming fatigued.

When you exercise, have a fever, digest, resist to hot weather, or are under stress your heart rate usually speeds up to meet your body's increased need for oxygen and nutrients carried in the blood. As a



result, your pulse rate normally varies from minute to minute.

However through regular training with exercises such as ZZ your HR will be lower than if you were not trained.

The type of posture will also influence your HR, at rest, the lying position will have the lowest HR, it will be higher in sitting position and even more in standing position. If you add muscle exercise your HR can reach very high values.

In normal situation HR in lying position should be 1 to 2 bpm less than HR in standing position. If this difference is above 20 bpm then the patient has a quite weak heart.

#### *Heart rate recovery after exercise*

Heart rate recovery after physical exercise gives precise indication of your health. In US, scientific researches demonstrated that a delayed decrease in the heart rate during the first minute after graded exercise is a powerful predictor of overall mortality. For healthy people, once reached their maximum point of exhaustion, then after one minute resting, the HR should fall by at least 20 bpm. People with an abnormal heart rate recovery, the heart rate only falls by a little bit during that first minute after exercise.

#### *Rapid acceleration of heart rate after violent exercise*

After violent physical exercises, the increase of pulse rate is very obvious. For example: just after a well conditioned athlete has performed a 100 meter sprint which should take less than 10 seconds to complete running in more than ten seconds time, HR should peak between 150 to 200 bpm, then he would need around 40-50 minutes to recover completely. After 400/800-meter middle distance races, HR peaks at 180 to 200 bpm, requiring one to two hours for recovery.

For people with weak body or patients, walking faster or longer, climbing stairs, all these violent exercises will produce acceleration of HR, frustration and wheeziness, within a much shorter time than healthy people.

#### *Zhan zhuang & Heart rate*

Post standing can strengthen cardiac muscles. Under selective and regular practice of ZZ, resting HR will decrease and improve the heart blood vessels system.

An important advantage of ZZ exercise is to prevent weak, old or sick people from violent acceleration of HR during and after the exercise: this method is from this point of view the most ideal one for such people.



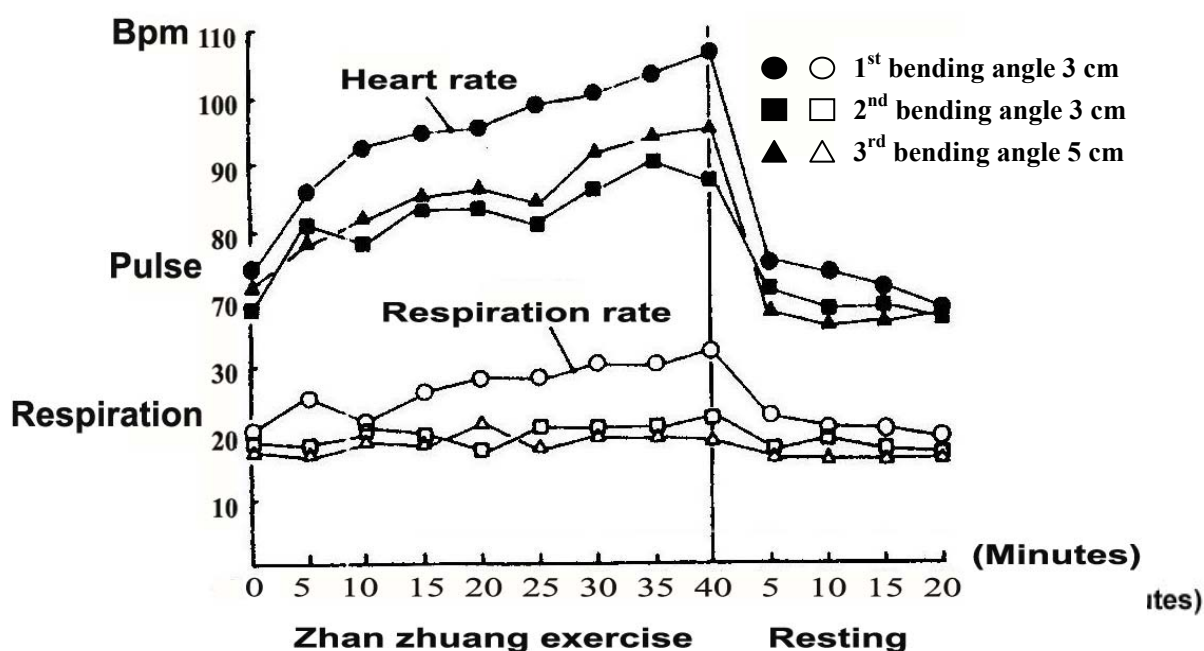
Now let's discuss about how RR and HR are related to ZZ

### 1. Comparison of RR & HR: before and after ZZ

Our research was held with a group of four patients. We used a height measuring scale to adjust precisely bending angles to be respected during ZZ exercises. These patients were requested to stand every day, during 40 mn. Each time their RR and HR were reported.

All results are reported in Figure 2-1.

**Figure 2-1: ZZ Experimentation - Evolution of RR and HR**



In Figure 2-1, we present the average value of the four patients. Three bending angle were selected, 1st and 2nd angles were 3cm and the third angle 5 cm.

Between each session (angle): they trained continuously during 15 days.

The posture imposed during this experimentation was a standing position with lifting/holding posture for upper limbs. We used a stadiometer (height measurement rod) to fix each patient's bending angle.

For example 3 cm bending angle will request the patient to stand at three cm less high then in normal standing.

Generally in the beginning, patients are even lower then the



head piece (one or two cm below it), but after 5 to 10 mn as their two legs are progressively tired, patients tend to straighten again their knee: then their head is touching the stadiometer's head piece. But as the head piece is fixed by a lock knob, patients are maintained under this height.

*Average Heart Rate increase in 1<sup>st</sup> bending angle*

As we can see from the results, after a period of training, Heart Rate, will no more accelerate as in the beginning:

In Zhan Zhuang exercise, Heart Rate will have an increase of 7 (seven) Bpm after 10 mn practice, then 5mn later it will jump only 3bpm more and finally after 40 mn total standing, it will reach 107 bpm.

These results show that in ZZ training, the practitioner will work with a progressive increase of HR, and the relative increase can be maintained during a long time.

HR is directly related to the legs bending angle and the duration of exercising. In other words the more you increase bending angle or time of training, the more your HR will jump up.

*Average Respiration Rate in 1<sup>st</sup> bending angle*

RR is increasing gradually as HR in the starting phase.

The initial RR is 20 Bpm. After 40 mn of ZZ exercise RR reaches 31 Bpm, totaling an increase of 11 Bpm.

This increase is mainly due to the complete inexistence of practice in this unusual posture: all muscles of shoulders, back, chest, etc...cannot relaxed sufficiently, thorax cannot also expand sufficiently, so that Pulmonary Ventilation is still not enough, as a result your RR is increasing.

At that time breathing becomes shallow, fast, thick and substantial.

*Results of 2<sup>nd</sup> bending angle*

After half month of ZZ practice, results of this experimentation show an average initial HR dropping down to 69 Bpm with is 6 Bpm less than the initial HR of the 1<sup>st</sup> bending angle. After 35 mn of practice HR reaches its peak at 90 bpm, totaling 22 bpm more than resting HR.

RR reaches 22 Bpm which only 4 Bpm above the resting RR.

*Comparing 1st and 2nd bending angle results*





By comparing results of 1<sup>st</sup> and 2<sup>nd</sup> bending angle, it is obvious that in the 2<sup>nd</sup> bending angle HR and RR have decreased: these are the results of 15 days of ZZ practice allowing an obvious improvement in the circulation system and respiratory system.

The resting values of RR and HR have all fallen from 5 Bpm between these two measurement campaigns.

### *Results of 3<sup>rd</sup> bending angle*

After additional 15 days of training, we collected results of experimentation which show an increase of physical effort. In fact the third bending angle of two legs was set up at 5 cm instead of 3 cm as it was for the 1<sup>st</sup> and 2<sup>nd</sup> bending angle.

Heart rate: after 40 mn, HR reaches 94 Bpm which is 22 Bpm increase compared with the resting HR and % Bpm increase compared with the 2<sup>nd</sup> bending angle.

Respiratory rate: after 20 mn, RR reaches 21 Bpm which just one Bpm more than in resting RR. We can also check that later there is no more increase but rather decrease of RR.

In addition we noticed also that after ZZ exercise, just stopping 5 mn will demonstrate improvement of pulse and breathing:

- new resting HR is 4 Bpm less than initial resting HR,
- new resting RR is 2 Bpm less than initial resting RR,

When this new resting value of HR and RR is the same whether you are resting after 20 mn or 5 mn, you can conclude that the physical condition of patients has reached an important and durable improvement.

## 2. Concerning HR change each 10 second period

Any conventional sport brings to suffocation and lack of oxygen, after strenuous physical training, blood previously contained in external veins of thorax is rushing very fast, with a high pressure, to right atrium, as a result during this short transition right atrium may be submitted to a substantial enlargement.

During the first minute after strenuous physical training, you will notice a large difference between HR taking the 1<sup>st</sup> period of 10 seconds with the 6<sup>th</sup> (and last) period of 10 seconds, this can reach even 10 beats.

So this important difference is not bearable to the average physical condition and is even worse for patients



According Chuan Tao's 《Medical treatment with physical training》, here are some data on number of heart beats during period of 10 seconds after strenuous physical effort, in Table 2-4.

**Table 2-4**  
**Heart beats before and after physical exercise every 10 seconds period**

Period (10 seconds)	1	2	3	4	5	6	Total rate (bpm)
Pulse before exercise (beat)	12	12	12	12	12	12	72
Pulse after exercise (beat)	22	18	20	15	13	12	100

According to Table 2-4, after physical exertion, during the first 10 second period, we can count 22 beats, then it will reduce gradually, so that at the sixth 10 second we can only count 12 beats, as a result the total Heart rate during this first minute after exercise, although accounting 100 Bpm, but in fact reveals a difference of 10 beats between these two 10 second periods.

In fact this indicates us that referring Heart rate to the “number of beats per minute” is not sufficient to completely understand the real loading of your pulse:

For example the first 10 second period will rather indicate an average rate of  $(22 \times 6 = 132)$  or the first 20 second period will correspond to an average rate of  $(40 \times 3 = 120)$ .

*10 second periods after Squatting exercise*

Here are the results of an experiment on squatting exercise requesting a fixed number of descending/ascending within a fixed period of time (30s, 1 mn, 2 mn) – Table 2-5

**Table 2-5 Heart rate changes after squatting, descending/ascending exercises**

Period (10 s) Pulse (beats)	1	2	3	4	5	6	Total rate (bpm)
Resting pulse	12	12	12	12	12	12	72
After 30 s. squatting, descending/ascending 20 times	20	19	17	16	15	14	101
After 1 mn squatting, descending/ascending 40 times	22	22	19	19	17	17	116
After 2 mn squatting, descending/ascending 80 times	28	26	24	22	20	19	139



From results of Table 2-5, **after 30 s. squatting, descending/ascending 20 times**, the first 10 second period counts 20 beats which is 8 beats more then in resting conditions and in the sixth 10 second period, it reaches 14 beats which is comparatively 6 beats less then the 1<sup>st</sup> period.

**After 1 mn squatting, descending/ascending 40 times**, the 1<sup>st</sup> and 2<sup>nd</sup> 10 second period show a same rate: 22 beats then this rate is gradually decreasing up to 17 beats at the 6<sup>th</sup> period.

**After 2 mn squatting, descending/ascending 80 times** here there is an obvious increase compared to the two previous campaigns. 1<sup>st</sup> period has 28 beats, then decrease gradually to 19 beats, which is a resulting HR of 139 bpm and 9 beats difference between 1<sup>st</sup> and 6<sup>th</sup> period.

This shows that in this case the amount of physical effort is more important so that it requires a larger time for the body to recover.

#### *10 second periods after Zhan zhuang*

In Table 2-6 are presented 10 second periods campaigns after Zhan Zhuang practice, all pulse measurements were tracked electronic devices for automated campaigns.

**List 2-6 10 second periods HR changes before and after Zhan Zhuang (ZZ)**

Pulse (beat) \ Periods (10 s)		1	2	3	4	5	6	Resulting HR (Bpm)
<b>First campaign</b>	<b>Resting sitting posture before ZZ</b>	13	13	12	12	13	12	75
	<b>After 10 minutes ZZ</b>	18	18	18	17	17	18	106
	<b>After 20 minutes ZZ</b>	17	18	17	18	17	17	104
	<b>After 30 minutes ZZ</b>	17	18	18	17	17	16	103
	<b>Resting sitting posture after ZZ</b>	16	16	16	16	16	16	96
<b>Second campaign</b>	<b>Resting sitting posture before ZZ</b>	13	12	12	13	13	13	76
	<b>After 10 minutes ZZ</b>	20	19	19	19	19	19	115
	<b>After 20 minutes ZZ</b>	21	20	20	19	19	19	118
	<b>After 30 minutes ZZ</b>	19	19	19	20	19	20	116
	<b>Resting sitting posture after ZZ</b>	17	17	17	17	17	17	102

According to Table 2-6, during ZZ each 10 second period within one minute does not present significant difference with



another (max difference: 2 Bpm), especially just after exercising where each 10 second period has the same HR throughout the first minute.

This is certainly not possible to obtain in normal physical training with equivalent effort but where suffocation and lack of oxygen would already lead you to exponential increase of HR.

Example: In second campaign after ZZ training for each interval of 10s, HR stays constant to 17 seconds and during ZZ: HR reaches 118 Bpm but only with a max difference between each 10 second period of 2 Bpm.

This is the most important advantage in healing training of ZZ. This also confirms it as a safe physical exercise for patients suffering from serious diseases such as coronary diseases, etc...and for older generations.

### 3. HR changes according to different postures

#### 3.1 HR changes for different sitting positions

Table 2-7 presents the results of HR experimentation with three forms of sitting posture performed by a same individual.

**Table 2-7 HR changes according to different sitting postures**

Heart rate (Bpm) / Time (minute) / Sitting postures	HR in sitting post	ZZ training (mn)		
		10	20	30
1 <sup>st</sup> form: vertical tibias	70	74	72	70
2 <sup>nd</sup> form: both hands lifting/embracing	68	76	76	74
3 <sup>rd</sup> form: both hands & feet hooking/lifting	72	88	80	82

#### *1<sup>st</sup> sitting form: straight tibias*

Let's review results of table 2-7: in **vertical tibias sitting form** after 10 mn practice HR shows an increase of 4 beats compared with the resting HR, which is almost an insignificant change.

This sitting exercise of ZZ requires a minimum physical effort: keep spine erected while four limbs are not working significantly.

This can be a good starting posture for patients and old



practitioners, HR may present some changes but for any healthy practitioner this posture will not provide important results.

*2<sup>nd</sup> sitting form: hands lifting/embracing*

This form requires both hands to assume lifting and holding posture, this will require additional amount of physical effort, as a result HR is slightly increasing compared with 1<sup>st</sup> form (**straight tibias sitting posture**), in the best conditions it may increase HR with 8 beats.

*3<sup>rd</sup> sitting form: hands & feet lifting and hooking*

In this sitting form as both hands and both legs are lifting and hanging, the amount of physical effort is much increased than in 1<sup>st</sup> and 2<sup>nd</sup> form, after 10 minute practice, HR reaches 88 Bpm which is an increase of 16 Bpm than the initial resting rate before ZZ exercise.

Once you get tired you can lower your legs and in the same time your HR will decrease.

Generally speaking sitting posts are involving relatively small amounts of power so that they cannot much bring benefits to healthy and athletic bodies but still are valuable exercises for patients and old people.

### 3.2 HR changes for different standing postures

In this experimentation two legs bending angle have been fixed with stadiometer (height measurement rod), fixing training angle to 4 cm (below normal standing height), are presented all HR with various hands postures - Table 2-8.



Table 2-8 HR changes according to different standing postures

HR (Bpm) / Standing postures	Time (mn)	Sitting Resting HR (before)	During exercise after ZZ			Standing resting HR (mn) (after 0)	Sitting resting HR (mn) (after 0)	Sitting resting HR (mn) (after 10)
			10 mn	20 mn	30 mn			
Relaxed shoulder lifting-embracing		74	84	90	85	/	73	71
Front chest supporting-pulling		71	95	92	94	/	71	67
Wrapping expanding		70	86	91	94	83	/	71
Separating water forward/backward		71	91	94	95	84	/	70

According to Table 2-8, in **Relaxed shoulder lifting and embracing standing form**, the amount of physical effort is relatively small: after 20 mn of practice to 20 minutes: HR reaches to 90 Bpm which is an increase of 16 Bpm compared with previous resting HR.

**Front chest supporting and pulling standing form** is the one which induces the highest increase, HR remaining between 92-95 from the beginning to the end of the exercise, inducing 24 Bpm max compared with the resting HR, and an average of 8 Bpm compared with Relaxed shoulder form.

This indicates us that within a same leg posture, but with different hand posture, in this case with angle in armpits: upper limbs amount of physical effort is bigger so that HR is higher. In addition we can notice that after 30 mn practice in both standing forms and immediate sitting resting, HR returns to the initial resting values.

**Wrapping expanding standing form** is not much different from **Separating water forward/backward** or from **Front chest supporting pulling** in terms of HR rate changes.

Once you are terminating these two last forms (**Wrapping** and **Separating**): just drop down your hands, straighten your legs (no more bending angle), then you will notice that HR decreases down with 11 Bpm less than 30 mn training rates.

**Separating water forward/backward standing form** requires smaller angle between elbow/armpit and rib plane,



although this angle is smaller than in **Front chest supporting-pulling form** and **Wrapping expanding form**, but because its specific hands position which requires much distance from shoulders, so that on this prolonging moment of forces, power involving shoulder and arm's muscles is much important, so that its HR is substantially increasing compared to **Relaxed shoulder lifting/embracing form**.

### 3.3 HR changes for different bending angles

In this experiment we are using a same hand posture with various bending angles applied in the two legs. We used a stadiometer (height measurement rod) to fix each patient's bending angle. Results of this experiment are shown in Table 2-9.

**Table 2-9 Heart rate changes for different bending angles of two legs**

HR (Bpm) Bend angle	Time (minute)	Sitting resting HR(Bpm) before exercise	During training HR completing (mn) exercise			Sitting resting after exercise		Max HR increase	Min HR increase
			10	20	30	5	10		
4 cm		71	95	92	94	71	67	+24	+21
6 cm		80	95	99	105	91	75	+25	+15
8 cm		75	106	104	103	96	76	+31	+28
10 cm		76	115	118	116	102	84	+42	+39

According to Table 2-9 we can verify that HR is increasing with the bending angle and that for a higher bending angle it is required more time to recover a normal HR.

When both legs are maintaining banding angle of 4 cm, HR Max reaches 95 Bpm and you need just to rest 5 minutes to recover from initial resting HR.

With 6 cm bending angle, HR Max reaches 105 Bpm which is 25 Bpm more than initial resting but we can notice that 5 mn resting is not enough to recover HR. This is probably due to insufficient rest between two bending angles HR measurements: 6 cm bending angle has an initial HR value of 80 Bpm. HR Max here reaches 106 Bpm which is 31 Bpm more than resting HR: this time 10 mn resting is required to recover initial HR.





In 10 cm bending angle, HR Max reaches 118 Bpm which is 42 Bpm more than resting HR: you can notice that even after 10 mn resting HR has not yet recovered back to initial resting HR.

### 3.4 HR changes according to progress in ZZ training program

Through this experiment, we found that although after a certain progress in the ZZ training, subjects may not always feel obvious changes in his pathologic symptoms or in his perception of physical strength; however it was proven clinically that their physiologic functions shown significant improvement. Here are the results in Table 2-10.

**Table 2-10 HR changes according to progress in ZZ training program**

Date of experiment	Name	Sex	Age	Sitting HR before practice (BPM)	HR during exercise (Bpm)				HR after resting standing 10 mn (Bpm)	Bend (cm)	Cumulated ZZ training
					10 mn	20 mn	30 mn	40 mn			
12.3	Lu	Male	65	78	73	73	73	84	72	4	Already practiced half year
12.23	Lu	Male	65	79	84	84	84	84	69	6	Already practiced half year
12.14	Zhang	Male	23	72	84	102	98	-	72	3	First time
12.24	Zhang	Male	23	70	82	86	80	80	61	3	Tenth time

Let's start with the first case, Mr. Lu, male, 65, suffering from bronchial asthma since many years, although in past he did not stop medical treatment, but still he was apprehending every winter, afraid to leave his home or even walk outside. He started post standing in summer and never interrupted his training since then, soon his asthma symptoms (shortness of breath, coughing, viscous and phlegmy sputum and difficulty exhaling...) were obviously improving, gaining in physical strength and



like feeling a new well being. His resting Heart rate in 3<sup>rd</sup> Dec. standing posture was 78 Bpm, using stadiometer to fix his bending angle to 4 cm, he practiced Relaxed shoulder lifting and embracing form, after 10 minutes of practice, HR descended to 73 Bpm, and after always stayed to 73 Bpm. Once reached 40 minutes practice, HR reached just 84 Bpm which is only 6 Bpm more than his resting HR. It shows that this combination standing posture/bending angle has already no more effect on himself. 20 days later we proceed again to another measurement campaign this time with 6 cm bending angle requiring him to hold **All round post (Universal post)**, his HR stabilized to 84 Bpm which is only 5 Bpm more than his resting HR.

As the other subject, we choose a strong and healthy young man, Mr. Zhang, 23 who never practiced before post standing. He started training ZZ in winter 14 Dec. assuming the same hand posture than Mr. Lu, but two legs just bent 3 cm, after 10 minutes practice his HR reached 84 Bpm, after 20 minutes it reached 102 which was 30 Bpm more than in initial resting and then he cannot any practice after 30 minutes.

After daily practice of ZZ training (once everyday) during 10 days, the new results show that he can stand up to 40 mn, his pulse reached 86 Bpm after 20 mn which is 16 Bpm more than resting HR: this is half of increase if we compare it to the first time.

All these results confirms that no matter your physical condition, chronic disease patient or athlete, young or old, everyone can find in ZZ an effective way to strengthen his body and reinforce his internal organs.

#### *II.5.4 Core concept of blood*

The average adult has about five liters of blood living inside of their body, coursing through their vessels, delivering essential elements, and removing harmful wastes. Without blood, the human body would stop working.



Blood is the fluid of life, transporting oxygen from the lungs to body tissue and carbon dioxide from body tissue to the lungs. Blood is the fluid of growth, transporting nourishment from digestion and hormones from glands throughout the body. Blood is the fluid of health, transporting disease fighting substances to the tissue and waste to the kidneys.

Because it contains living cells, blood is alive. **Red blood cells or erythrocytes** and **White blood cells or leukocytes** are responsible for nourishing and cleansing the body. Since the cells are alive, they too need nourishment. Vitamins and Minerals keep the blood healthy. The blood cells have a definite life cycle, just as all living organisms do.

Approximately 55 percent of blood is plasma, a straw-colored clear liquid. The liquid plasma carries the solid cells and the platelets which help blood clot. Without blood platelets, you would bleed to death.

When the human body loses a little bit of blood through a minor wound, the platelets cause the blood to clot so that the bleeding stops. Because new blood is always being made inside of your bones, the body can replace the lost blood. When the human body loses a lot of blood through a major wound, that blood has to be replaced through a blood transfusion from other people.

But everybody's blood is not the same. There are four different blood types. Plus, your blood has Rh factors which make it even more unique.

#### *Red blood cells (RBC) - Haemoglobin*

The number of RBC may vary for each adult human:

- male: 4.7 to 6.1 million cells/cubic millimeter
- female: 4.2 to 5.4 million cells/cubic millimeter

These specialised cells are like flattened discs, which gives them a much greater surface area with which to exchange oxygen and carbon dioxide in the lungs and with body cells. Red blood cells are able to carry oxygen so efficiently because of a special protein inside them: haemoglobin.

It transports oxygen from the lungs to the rest of the body. Haemoglobin bonds 97% with oxygen in the lungs, exchanges it for



carbon dioxide at cellular level, and then transports the carbon dioxide back to the lungs to be exhaled.

Therefore the more you have haemoglobin the more your blood contains oxygen.

Each 100 mm cube of blood contains around 14-16 grams of haemoglobin, each gram of haemoglobin can combined with 1.36 ml (milliliter) of oxygen. If every 100 ml blood contain haemoglobin 14 grams, so each 100 ml of blood bonds  $14 \times 1.36 = 19.04$  ml of oxygen.

### *White blood cells (WBC)*

WBCs defend the body against infecting organisms and foreign agents, both in the tissues and in the bloodstream itself. One cubic millimeter of blood contains between 4000 and 10000 WBC; the number increases in the presence of infection.

### *The right ratios of RBC and WBC*

The ratio of cells in normal blood is 600 RBCs for each white blood cell and 40 platelets. Each cubic millimeter of normal blood should not present too many variations in terms of numbers of cells.

For example RBC should not vary more than 500 000 units: these ratios are expressing the balance in the functions of each component:

- a sharp decrease in the number of leukocytes (leucopenia) strips the blood of its defense against infection,
- "anemia" is a general term that refers to a decrease in red blood cells. Anemia can occur from either a decrease in the number of red blood cells, a decrease in the hemoglobin content, or both.

Adult human's blood contributes to 7%-8% of his total weight. Blood circulation is not occurring in the same time for all parts of the body: for example according to Chinese Traditional Medicine the Liver stores bloods and the Spleen controls it.

The liver, whose function is to soothe the body and to purge waste, acts as a storage place for blood. The spleen manipulates the movement of internal forces, acting as the source for generation and transformation of various forces in the body. These forces produced by the spleen manage the body's blood circulation.

### *Circulation of blood in resting and physical exercise*

For human body in rest there is around 55% to 75% of whole blood which is circulating other portion is stored.

During physical exercise more blood can be required according to the



physical exertion, to supply in oxygen and energy each organ and strengthen metabolic functions.

#### *Experiments on blood and Zhan zhuang*

We based our experiment on the blood analysis of five subjects, before and after ZZ exercise.

The checking method was:

- take a blood sample from the base of their ear before standing,
- take another blood sample from their ear after ZZ exercise.

Among the results, for one patient we found out that after one hour of post standing, that the quantity of haemoglobin increased up to 3.2 gram (for each 100 mm cube of blood), RBCs counted 1.52 million more (per ml), WBC 3650 more, this was among the most important increase ever recorded by our team.

Four other subjects practiced during 40 minutes, the increase of haemoglobin was between 1.5 to 2.3 gram/ml; the increase of RBC was between 210.000 to 590.000 per ml and the increase of WBC was between 400 to 600 per ml.

The analysis on Haemoglobin, RBC and WBC presented clear increase after ZZ, all directly related to the amount of physical effort and to the duration in exercise.

This shows very clearly that through ZZ, the practitioner is improving his blood circulation, increasing the quantity of Haemoglobin which is in fact increase of oxygen supply (binding and transporting) compared to the resting state, often perceived as further relaxation and comfort in the whole body.

#### *II.5.5 Main physiologic benefits of ZZ*

##### *Cerebral cortex effects of ZZ*

The effects of ZZ practice on cerebral cortex:

- improve control of signal excitation,
- increase level of excitation.

It reveals its effectiveness in improving the motor system but also higher brain functions.

When applied in medical treatment, ZZ just requires to hold a single posture without moving, which will save the cerebral cortex from monitoring further signals normally used in movements: constantly keeping balance or checking environment or preparing next



movement... This reduction of signals coming from external sensorial organs, maintaining the same group of muscles in a same exercise, will contribute in helping the practitioner to reach internal control. Regarding ZZ as a physical activity, it is through cycles of muscles contraction /relaxation that one's can achieve a higher mental activity related to the Second kinetics of physical exercise: strengthening muscles, improving nerve system and higher mental functions.

### ***ZZ's benefits on breathing system***

Post standing is a physical exercise which does not lead the breathing system to a situation of oxygen debt and does not require respiration blocking.

In this sense ZZ is transgressing the conventional group repartition of sport.

Let's see further details.

### ***Anaerobic/aerobic sport***

If we take breathing as a taxonomic criterion, sports can be divided in two big groups:

1. Anaerobic: The first one includes all the sports that use the technique of respiratory stop or blocking. The most typical among these are force sports such as athletic weight throwing, weightlifting, body building, gymnastics etc. In short, we might say that here the anaerobic extreme is concerned – the one which imposes apnea (blocking the thorax and respiration). The main advantage of diaphragm blocking is the rising, for the moment, of the explosive force of the sportsman. A rise in execution speed for maximum force efforts has also been observed. The classic example is the snatch of weightlifting in which force and speed are simultaneously implied on the basis of respiratory blocking.

In such a situation the muscles can continue to break down glucose to liberate energy for a short time using anaerobic respiration. This partial breakdown produces lactic acid, which results in a sensation of fatigue when it reaches certain levels in the muscles and the blood.

Anaerobic sports require athletes to sustain high levels of energy output, with heart rate levels staying between 90 and 100 percent for periods of 30 seconds to three minutes, and to recover in a period ranging from approximately 30 seconds to 2 minutes. Anaerobic athletes must be in superior anaerobic





condition and prepared to neutralize high levels of lactic acid. *This respiratory blocking, inevitable in the above-mentioned sports, has also some disadvantages. Among these we could mention high pressure values in the thorax, abdomen and skull, high pressure on blood vessels with low feed-back through the veins etc. Thus, due to the rising of pressure inside the eyes the aggravation of previous short-sightedness is possible. Also, in the inferior limbs, varicose veins can either appear or worsen. Effort in exclusively anaerobic conditions increases rigidity both in the blood vessels and in the muscles.*

2. Aerobic group: This second big group is the one of sports that does not use respiratory stop. Here we enter the realm of purely aerobic effort. The typical examples are running races, swimming, cycling etc. - generally efforts on long and very long distances. In these events the muscular force implied is little - medium at most - the stress affecting the cardiovascular component and leading to increased cardiac frequency and pulmonary ventilation.

There is also a third category - mixed sports, both aerobic and anaerobic, in which the two techniques alternate. This is the case of sports games, contact sports, rhythm breaking in medium distance running races, etc...

#### *ZZ compared to conventional sports breathing*

But in post standing you can control precisely the amount of physical effort, set it up according to each physical condition and maintain during a long period a steady increase of Heart rate during exercise.

But according to our experimentation in most of the case you cannot exceed the double of resting HR. Because when the amount of physical effort is exceed this value, muscles and tendons will feel like a painful electric shock contraction and cannot but stop any physical exertion.

We can finally say that in ZZ you will progressively reach the maximum amount of physical effort you can bear: regular increase of HR, but without any oxygen debt or out of breath situation common to conventional sports as described previously.



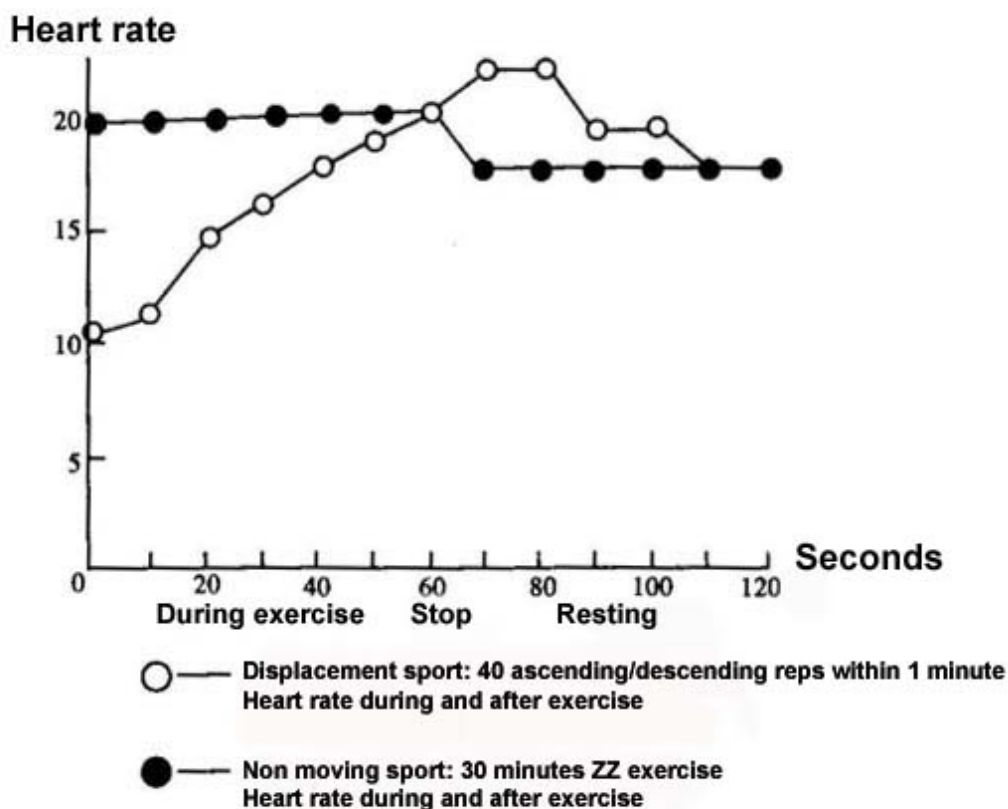


### ***ZZ's benefits on circulation system***

The benefits of post standing exercise on circulation system can be perceived directly after the training: pulse rate is rapidly descending.

In post standing, as muscles are exercising contraction/relaxation there is no suffocation phenomenon, also no have breath difficult phenomenon: the inner pressure in thorax and abdominal cavity' will not suddenly increase. After physical exertion (5 to 10 seconds), there will be no enlargement of right atria as in suffocation situation: HR is directly descending.

This is a major advantage compared with displacement sport where after physical exertion, HR is suddenly rising then descending: ZZ is therefore much suitable to patient under medical treatment or people with weaker body such as seniors. c.f. Figure 2-2: HR Comparison of ZZ vs. Knee bending.



**Figure 2-2**

### ***ZZ's effect on muscular system***



Let's revise the 19 major points to consider for our skeleton muscles and particularly the muscular movements of bones:

1. Skeleton Muscles generate Force and produce Movement only by *contracting* or *pulling* on Body Parts.
2. Individual Muscles can only *pull*; they *cannot push*.
3. Skeleton Muscles are joined to bone by tough connective tissue called *tendons*.
4. *Tendons* attach muscle to bone; the *origin* is the more stationary bone, the *insertion* is the more movable bone.
5. Tendons are attached in such a way that they *pull* on the Bones and make them work like levers. The movements of the Muscles and Joints enable the Bones to act as levers.
6. The Joint functions as a *fulcrum* (The fixed point around which the lever moves) and the Muscles provide the Force to move the Lever.
7. Usually there several Muscles surrounding each Joint that pull in different directions.
8. Most skeletal muscles work in pairs.
9. When one Muscle or set of Muscles contracts, the other relaxes.
10. The Muscles of the upper arm are a good example of this dual action: antagonistic muscles. **Flexor**, a muscle that bends a joint. **Extensor**, a muscle that straightens a joint.
  - A. When the Biceps Muscle (on the front of the upper arm, Flexor) contracts, it bends or flexes the elbow joint.
  - B. When the Triceps Muscle (on the back of the upper arm, Extensor) contracts, it opens, or extends, the elbow joint.
  - C. A controlled movement requires contraction by both muscles.



11. Antagonist muscles are opponents, muscles which have opposing or opposite functions. A muscle pulls when it contracts, but exerts no force when it relaxes and cannot push. When one muscle pulls a bone in one direction, another muscle is needed to pull the bone in the other direction.

12. Synergistic muscles are those with the same function, or those that work together to perform a particular function. They also stabilize a joint to make a more precise movement possible.

13. A normal characteristic of all Skeleton Muscles is that they remain in a state of partial contraction.

14. At any given time, some Muscles are being Stimulated while other are not. This causes a tightened, or firmed, Muscle and is known as muscle tone.

15. Muscle Tone is responsible for keeping the back and legs straight and the head upright even when you are relaxed.

16. Exercise is the key to maintain good muscle tone within your body.

17. Muscles that are exercised regularly stay firm and increase in size by adding more materials to the inside of muscle fibers.

18. Muscle fatigue is a Physiological Inability of a muscle to contract. Muscle fatigue is a result of a relative depletion of ATP. When ATP is absent, a state of continuous contraction occurs. This causes severe muscle cramps.

19. Oxygen debt is a temporary Lack of Oxygen. As we discussed previously, this occurs Muscles will switch from the normal Aerobic Respiration to a form of Anaerobic Respiration called Lactic Acid Fermentation. As the oxygen becomes depleted, the muscle cells begin to switch. Oxygen debt leads to the accumulation of Metabolic Waste (Lactic Acid) in the muscle fibers, resulting in muscle fatigue, pain, and even cramps. Eventually, the lactic acid diffuses into the blood and is transported to the Liver. So if you ever experienced Soreness after prolong exercise, it may have been



caused by Oxygen Debt - your body could not provide your Muscles the Oxygen they needed to function properly.

Now back to Zhan zhuang exercise: our research showed us that bending angle is exercising Flexors (muscles that bend a joint) and mental activity is exercising Extensors (muscles that straighten a joint).

During Zhan Zhuang exercise, by setting bending angles, through the control of cerebral cortex and by maintaining the posture you can involve your whole body's flexors into a precise and determined amount of physical effort: this *flexor training* is recommended for medical treatment and health preservation.

But in Zhan zhuang exercise you can also use contraction/relaxation movements with mental activity to train *extensors*, it is called also *extensor training* or mental training of resting muscles. This special physical training is not very easy to understand especially in the beginning of your practice, after time spent to experiment by yourself all internal changes occurring with ZZ you will then gradually understand it.

In your ZZ training program you can dedicate separate time for flexor training and extensor training or practice both simultaneously.

You can practice them with local group of muscles or with whole body muscles.

When you will be able to reach a high level of training, all your muscles/tendons will be contracting like one, at that time you will be able to issue an explosive whole body power which is particularly important in combat.

By better control of muscles contraction/relaxation process, you will be able to improve your general muscle tone which consolidate the explosive whole body power discussed previously but also much more suppleness during decisive attacks...

### ***ZZ's effect on nerve system***

In fact by comparing and experimenting both displacement sports and non-moving sports we understand that:



- The first kinetics of physical training is mainly focused on training muscles,
- The second kinetics of physical training is mainly focused on training nerves.

When you are requesting your body or parts of it to retract and stretch in a certain order, this is the conventional physical training or First kinetics of physical training.

In the opposite when you are not moving but maintaining ZZ posture this is the Second kinetics of physical training involving, as we said before, your resting muscles.

This special training with constant monitoring of posture involved invariably much more control of nerves, especially excitation signals up to the cerebral cortex.

Benefits from this specific training include much more information exchanges between sensorial organs and cortex, improving the general motor system but also higher brain functions.

### ***ZZ's benefits as medical treatment: dynamic diagnostic and curative method***

Zhan zhuang can be an interesting method for medical treatment combining diagnosis and curative effects.

ZZ will base its work out on rising progressively the internal amount of effort from the state of tranquility up to a high level of physical training (2<sup>nd</sup> kinetics of physical exercise).

Changes occurring during this progression are countless but starting training parameters are quite limited: hold the posture (bending angle) and maintain it during a certain time (duration).

We will remind again one essential aspect of ZZ training: starting from the simply natural rooting of all physiologic functions (such as respiratory and circulatory functions) and enhance them gradually while preserving their internal balance, this high level physical training will provide to each organ the necessary space to reveal its real state: as a “dynamic vital functions diagnostic”.

“Dynamic vital functions diagnostic” is very different from the conventional diagnostic based on symptoms analysis and “static vital functions diagnostic”.



In fact detecting the real source of disease in a human body cannot be restricted only to local symptoms and vital functions diagnostic in resting: many diseases may not reveal physiologic changes during the resting phase of the body but will appear in the most obvious way during physical exercise. This special approach of considering dynamic functions of all vital functions to pursue a better apprehension of its health is certainly one of the most promising fields in the medicine of the future generations.

Moreover, as its most important contribution in medicine, post standing beside its aspect of dynamic vital functions diagnostic method, allows in the same time to strengthen body's vital functions and even to change its structure.

Zhan zhuang can be perceived a soft medicine, preventing from any side effect, using no external medicine than physical exertion, as the most natural and the most harmless healing method, especially suitable for patients or people with weak body, it can be used directly or as complement of medical treatment.

According to the present results of our research, we believe that Zhan zhuang can and will contribute for the further progress of many scientific disciplines such as medicine, sport physiology, systems biology dynamics, biological chemistry, etc... but all possible domains where Traditional Chinese Medicine and Western Conventional Medicine can combine their advantages to provide better method of health care for the mankind.



### **III. The different basic posts in Zhan Zhuang**

Zhan zhuang posts include lying posts, sitting posts, standing posts and walking posts. As the standing post is the most largely applied and provides the most obvious effects, Zhan zhuang is often assimilated to its standing post.

In the beginning of ZZ training, the practitioner can first concentrate his efforts to focus his mental, unify his thoughts and get rid of random thoughts during all postures assumed. As it not so easy to achieve, he can count mentally his breathing cycles, each breathing cycle including one inhalation and one exhalation, while breathing remain natural, he should avoid from prolonging or shortening their duration intentionally.





### III.1 Practicing Lying post

Lying post is practiced on mattress or any sleep surface, much suitable for weaker body or people suffering from insomnia.

The first form of lying post is involving a larger amount of physical effort.

When you start the first form of Lying post, try to count mentally your breathing cycles and hold it until you cannot bear anymore pains and tingling in both shoulders then drop them down and proceed to the second form, third form and finally the fourth form.

At the end of your lying post you can lie on your side or any most convenient posture to get easily to sleep. If you are practicing in winter and your room is relatively cold then start directly with the third form while keeping your both hands under your blanket to avoid catching cold.

Let's take an example: In the very beginning of your training you may count mentally up to six or seven hundred breathing cycles then get gradually to sleep. Later with more practice, you will be able to fall asleep after only three to four hundred breathing cycles. And this can still be reduced with further practice.

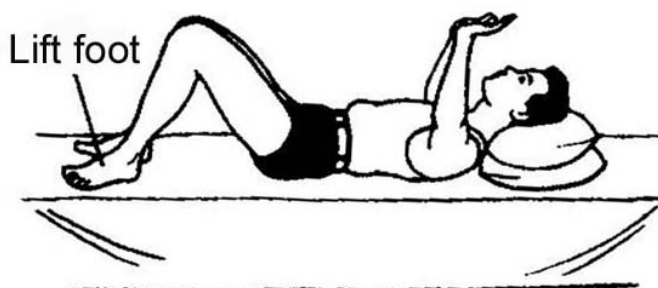
But counting mentally breathing may sometimes not suitable for the practitioner, especially when you do not feel comfortable to practice it then just forget it and practice your post without any constraint. This counting exercise can be applied to sitting and standing posts. But in later stages of training when you reach a better control of nerve excitation from your cerebral cortex, you will abandon it naturally.

#### **First form: lifting elbow and lift up foot**

Lying on your back, both feet shoulder width apart, both knees bending, both heels touching mattress and toes lifting up.

Both elbows lifting up, separated from the mattress by about 5 to 10 cm, keep them at this distance. Both elbows

are bending, the palm of the hand downward, showing hold object estate, or the palm of the hand upward, showing pushing and



**Figure 3-1**

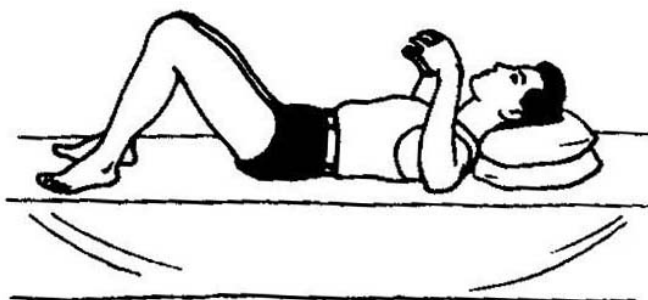


supporting estate. Both shoulders relaxed, do not use force and again do not hold your breath (Figure 3-1).

**Second form: dropping elbows and bending legs**

Lying on your back, both feet shoulder width apart, both knees bending, place soles and heels horizontally on the mattress.

Both elbows are touching mattress, both hands are still above the mattress, the center of palm facing down, ten fingers separated from each other, do not use force and again do not hold your breath (Figure 3-2).



**Figure 3-2**

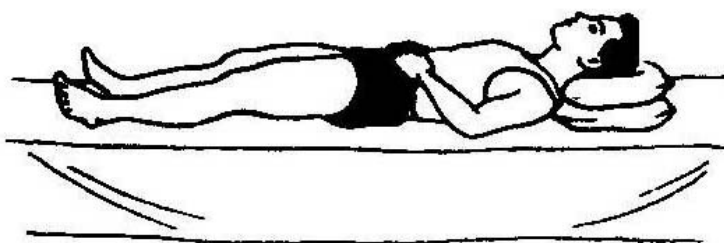
**Third form: straight legs and hands resting on the belly**

Both legs are now straight, placed horizontally on the mattress; both feet separated shoulder width apart.

Both elbows separated from the body, resting on the mattress or slightly lifting during exercise.

When you are finishing your exercise, drop your elbows, place your hands on or slightly above the belly and finally leave them on the belly when you are tired.

During this exercise fingers should be naturally separated. (Figure 3-3).



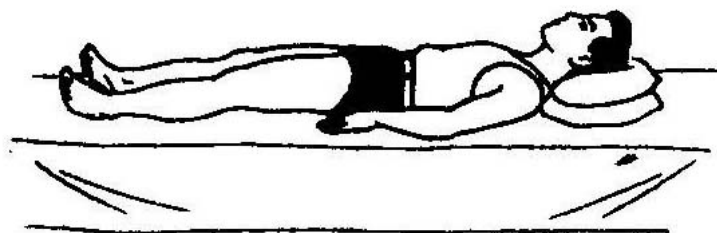
**Figure 3-3**



#### **Fourth form: dropping hand and lie on your back**

Both legs' posture is same as third form.

Both hands dropped on the mattress, both elbows slightly bending, separated from ribs, the center of palm is facing in or down. Hand with elbows alternate leaves bed keeps hanging, wait feel tired then again touching bed. Finally naturally drop asleep use this posture (Figure 3-4).



**Figure 3-4**



## III.2 Practicing sitting post

In sitting post the amount of physical effort is bigger than in lying post, but smaller than in standing post. Therefore it is suitable for patients who can stand up and move freely but still cannot stand for too long time.

As you can easily understand sitting post can be practice too in addition to standing post as an auxiliary exercise.

Sitting post is also a precious exercise for those who work in office or studying and use to spend time in sitting position. They can use the Fifth form of Sitting Post, legs straight but hands continuing to perform their daily duties: this can be great help for them to revivify and clarify their mind thus enhancing efficiency in their work (studies).

### *III.2.1 Large cane chair post*

Large cane chair has a large seat, two comfortable armchairs and a high back. For this reason large cane chair is suitable for weak body practitioner. The two armchairs can support both arms in their embracing posture, reducing the amount of effort for sustaining at a same level. Waist and lower back can also lean on its back. Both legs stretching, heels touching ground, toes lifted up.

After a certain period of training, your whole body will gain in strength so that you can change to the Common chair post

### *III.2.2 Common chair post*

Seat is still large, no armchairs and an ordinary chair back. Lower back and waist are leaning on the chair back but higher back and shoulders are separated from it to involve more training from the upper body. After sufficient training you can change to the Stool post.

### *III.2.3 Stool post*

Now during your sitting post you can only rely on yourself to hold your upper body posture, to sustain your arms and support your spine vertically.

You can use for this purpose a stool (with large seat) or even a hard mattress, sitting at the edge of the chair or the mattress. Knee crease is

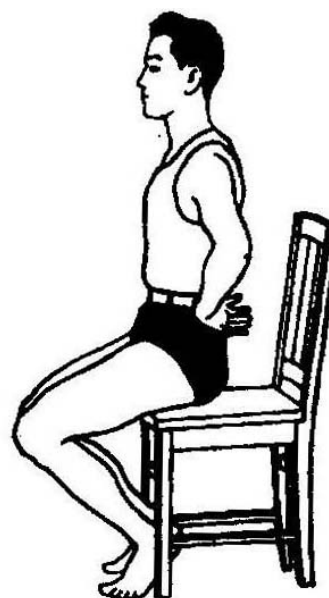


touching the edge of the chair (or mattress) as to support the vertical position of legs.

At the end of your sitting post, drop your hands, sit quietly and rest for 3 to 5 minutes, wait that any sensation of tingling, swelling, aching or pain disappear completely from your legs before standing up.

**First form: Bending knees and back of hands on lower back**

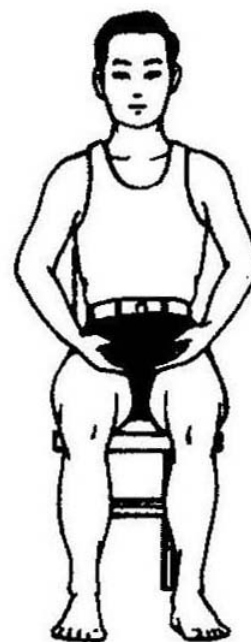
Sit at the edge of your chair, both legs bending (about 40-50 degree angle), place both feet under your chair, soles touching ground and lifting your heels. Back of hands placed lightly on your lower back, all fingers naturally separated, not use force, shoulder's muscle should relax (Figure 3-5).



**Figure 3-5**

**Second form: Stretching legs your leg and sitting**

Sit at the edge of your chair, body erected, both feet parallel, vertical and shoulder width apart, place in front of the chair, sole and heel are all touching ground, thighs and tibias are forming a perfect 90 degrees angle. Elbows separated from ribs, both hands placed on thighs, center of palm facing up or down, back erected, waist stretching, rise your head like suspended from the top, eyes looking forward, both shoulders relaxing. Do not use force (Figure 3-6).



**Figure 3-6**



### **Third form: Sitting while lifting and holding**

Both legs are assuming previous posture. Both hands lifted at navel level, center of palm facing up as supporting an object, both wrists shoulder width apart, elbow separated from rib, all fingers naturally separated and slightly bending. Back erected and waist kept straight, rise your head like being suspended from the top, eyes looking forward, both shoulders relaxed. Do not use force (Figure 3-7).



**Figure 3-7**

### **Fourth form: Resting on toes while lifting and holding**

Leg posture is the same as in the Third form. Both heels are slightly lifting. Both hands placed at navel's level, center of palm facing in, all fingers are naturally separated as supporting an object. Both shoulders relaxed, do not use force and do not hold your breath (Figure 3-8).



**Figure 3-8**





### **Fifth form: Stretching feet while supporting and embracing**

Sit on your chair, knee cleave leaning on the edge of the chair, both legs lifting, separated by a distance larger than shoulder width, adjust the height of your feet depending on your own physical condition. Place both hands below shoulder level and above breast level, center of palm facing in as if holding something, waist and back erected, rise your head like being suspended from the top, look forward, both shoulders relaxed, do not use force and do not hold your breath (Figure 3-9).



**Figure 3-9**

### **Sixth form: hook foot with pushing and supporting**

Both leg posture is the same as in Fifth form. Both heels facing each other, both legs turning outward, toes hooking and bending backward, to increase both legs physical strain. Lifting both hands upward of shoulder and downward of eyebrow, center of palm outward showing pushing and holding estate, waist and back keeps erect, raise your head watching forward, both shoulders relaxed, do not use force and do not hold your breath (Figure 3-10).



**Figure 3-10**





### III.3 Practicing standing post

Standing post is the best method of Zhan zhuang and it constitutes also the basic exercise of Dachengquan.

Standing posts include **Healing post** and **Combat post**. All postures in **Healing posts** require the right adjustment of physical effort for each practitioner: upper body's weight on lower limbs. This adjustment is achieved by setting the bending angle (knees) and the height of both hands.

**Combat post** is a side version of rest/regeneration standing post, as a result there is less weight on front leg and more on rear leg, front/rear distribution can start with 40/60 and progressively changes into 30/70.

But in **Landing dragon post** this distribution is inverted.

Due to the asymmetry of weight distribution, this type of post is not recommended for beginners.

**Healing post** is based on a perfectly symmetric distribution of weight on both legs which are generally shoulder width apart, both knees slightly bending as like kneeling down, arms placed relatively low as to be at a bearable level for practitioner under medical treatment.

Slightly lift both hands, center of palm facing in as to hold an object, or facing out as to support/push something. Hand level should not exceed eyebrows, not be lower than navel. They should not be separated from front for more than 30 cm but in the same time they should not be in contact with your body. Adjust hands/body distance according to these extreme positions, especially the alignment of shoulder and chest in order to avoid any oppressive effect on the respiratory function of lungs.

You can set up knee bending angle at the limit of bearable pain during your practice.

The objectives are: relaxation of shoulders, chest and back, free breathing, chest released, mental clarity and whole body very comfortable.

One advantage of standing post is that immediately after your strenuous standing exercise you can experiment, while holding your standing posture, various internal changes that may appear in your body as you progress, until unbearable level of tiredness in shoulders, pains or sensations of tingling/swelling urge you to interrupt this exercise.

At this moment, lower your hands; stretch back slightly or even completely your legs to rest. Beginners can start with 5-10 minutes of



practice during each session then gradually increase to 20, 30, 40 minutes up to a maximum time of one hour. In the first one or two weeks, your shoulders, knees, legs, all joints, waist, back, etc...may reveal some different reactions of tiredness or pain which should progressively disappear after two or three weeks of daily training. There are principally 24 forms in standing posts which can be divided in three groups: Assisted standing post, Basic standing post, Four limbs standing post.

### *III.3.1 Assisted standing posts*

**Assisted standing post** requires less amount of physical effort than **Basic standing post** as their bending angle are relatively small or they can reduce physical effort with the aid of external supports: such as wall, armchair, back chair, or any other object... Practitioners with weaker body can first chose it as preparative standing exercise before starting **Basic standing post**. In the sixth form, **Straighten back left/right side**, the main interest is to reduce the physical effort on one side, allowing it to rest for a moment and after change to alternate position to proceed on your exercise.

In fact all forms of **Assisted standing posts** can usefully selected and combined in Healing posts.

#### **First form: Bending legs and hands touching belly**

Both feet shoulder width apart, both knees slightly bending. One hand placed over the other or placed left/right touching slightly the belly. Both elbows apart from ribs, both hands are like silently counting breathing cycles through abdomen's expansion/contraction. One breathing cycle includes one inhalation and one exhalation. Breathing should remain natural, do not use force and also do not hold your breath (Figure 3-11).



**Figure 3-11**



### **Second form: Dropping elbows and lifting hands**

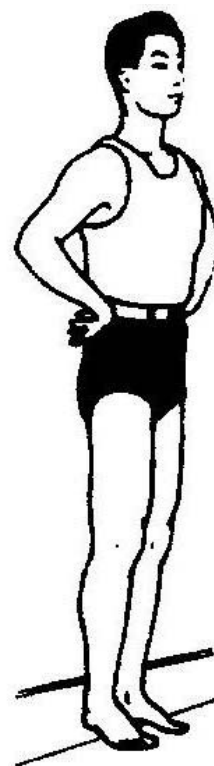
Lower limbs are assuming same posture as in First form. Both elbows are dropping naturally, both hands are lifting and placed on both sides of belly at navel level, center of palm facing up, fingers naturally separated as holding something, do not use force (Figure 3-12).



**Figure 3-12**

### **Third form: Back of hands placed on lower back**

Back leaning on a wall, a big tree or buttocks and thighs depending on the edge of a desk or mattress... All these external objects are helping you to assume your posture. Both legs vertical and straight, combining with heels, like standing at attention, soles and heels are touching ground or heels just slightly leaving ground. Back of hands placed on the lower back, center of hands facing out, elbows opening on both sides, shoulders relaxed, do not use force (Figure 3-13).

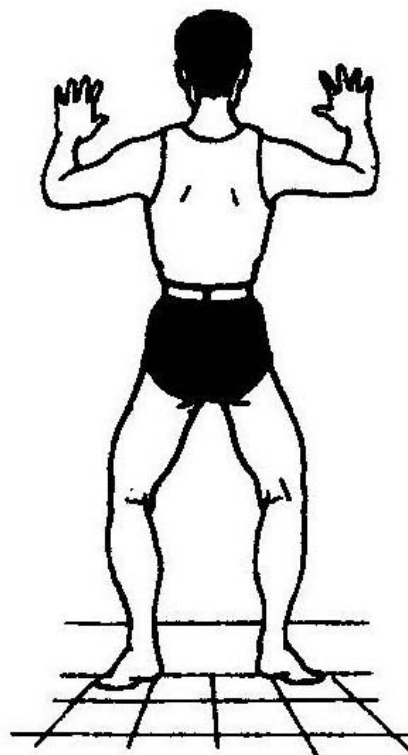


**Figure 3-13**



#### **Fourth form: bending legs and touching wall**

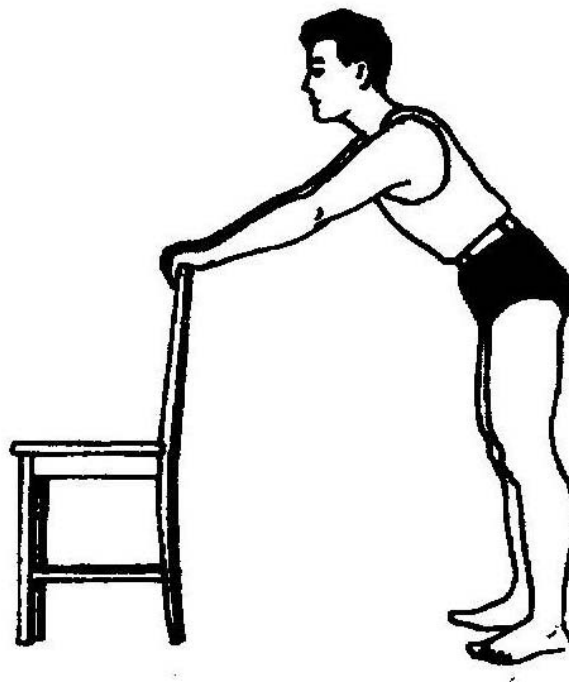
Facing to the wall, both feet separated from wall for about 30 cm. Legs posture is the same as in the First form, soles touching ground, heels slightly lifting. When your calves are too tired just drop them down. Distance between two hands should be larger than shoulder width. Place them at a higher level than your eyebrows, all fingers naturally separated. Let them touch the wall or the tree (Figure 3-14).



**Figure 3-14**

#### **Fifth form: bending waist with holding and pressing**

Both feet separated by a distance larger than shoulder width, soles and heels are touching ground heels slightly lifting. Bend your body, legs leaning back, raise your head and look forward. Both hands are holding and pressing on the chair back, desk or balustrade. Relax your shoulder and your belly, let your abdomen muscles naturally expanding and contracting (Figure 3-15).



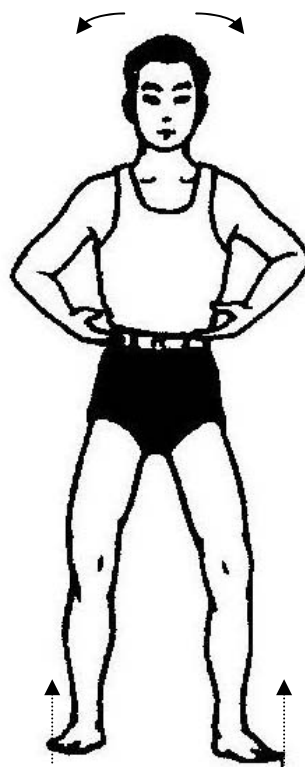
**Figure 3-15**



### **Sixth form: Straighten your back left/right side**

Both hands and legs can adopt any posture. Shift your whole body's weight on one side by leaning it without exceeding the vertical line passing through your foot

This posture will reduce by half the amount of physical effort compared with the standard posture. This will also help you to feel in each side the subtle internal changes intervening in your body, you can use it at will with all healing posts (Figure 3-16).



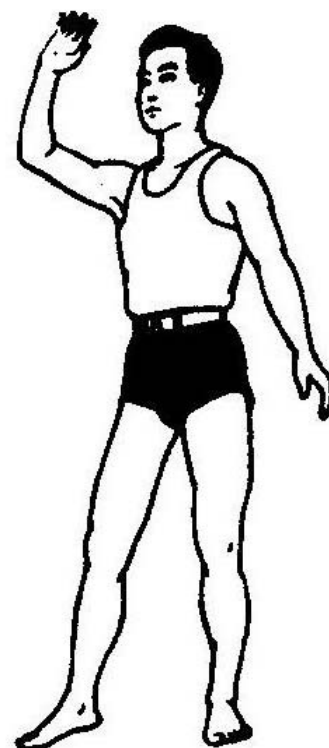
**Figure 3-16**

### **Seventh form: Swing arms left/right**

Both feet standing comfortably, rear leg straight, front heel slightly lifted, most of your weight on rear leg.

Let's say you are standing with left front leg, left hand should lift to a high level, elbow slightly bending, center of hand facing up, right hand dropping down, center of palm facing down. Raise your head face and have your body leaning to the right side (Figure 3-17).

Now you are standing with a right front leg, just interchange hands position while head and body remain unchanged.

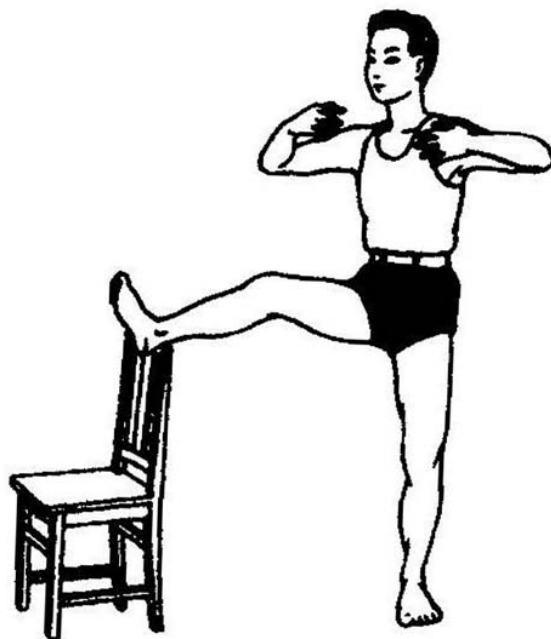


**Figure 3-17**



### **Eighth form: lifting leg left/right**

Lift one leg and place at hip level on the chair back, desk or balustrade, ankle hooking backward and body slightly bending. Lift both arms at a level between shoulder and breast, both elbows are bending as to hold something, center of palm facing in, all fingers naturally separated, do not use force (Figure 3-18).



**Figure 3-18**

#### *III.3.2 Basic standing posts*

There are **eight basic standing posts**. From the First form up to the Fifth form, all are **Basic Healing posts**; from the Sixth form to the Eighth form, all are **Basic combat posts**.

These eight posts are the most commonly used in Zhan Zhuang are arranged according to the ascending order of physical strain required. First form is also considered as a Preparation form and can be used when you are resuming your standing in order to reduce physical strain to its lower degree.

Second form requires bent legs and lifted hands so that physical strain is much increased. The more you lift your hands, the more you should bend your legs, and the more physical strain you are imposing to your body.

Concerning Combat posts and their three basic posts, both hands postural adjustment should be in phase with the degree of agility of four limbs in each post. Adjustment of physical strain on wrists and fingertips should also respect the previous condition





**First form: back of hands placed on lower back (Simplified form of Support-Holding post)**

Both feet shoulder width apart. Beginners should start with both feet in “V” shape, later with further after two feet will progressively be parallel.

Both legs are straight, back of hands placed on the lower back, center of palm facing back, all fingers naturally separated, both shoulders relax, do not use force (Figure 3-19).



**Figure 3-19**

**Second form: Shoulder relaxed – hands lifting and holding (Simplified version of lifting and holding form)**

Both feet shoulder width apart, both knees squatting down and holding bending angle from 2-3 cm in the beginning and later increasing gradually always below the limit of bearable pain for limit. Both elbows separated from ribs, both hands placed below breast and above navel, center of palm facing up, distance between body and hand should not exceed 33 cm, both shoulders relaxed, do not use force. Head straight, neck also straight, do not lower your head, do not bend down, or expanding excessively your belly, both eyes looking horizontally forward. Ear, shoulder, hip and ankle are aligned on the same vertical line with is forming a perfect 90 degree angle the ground plane.



**Figure 3.20**

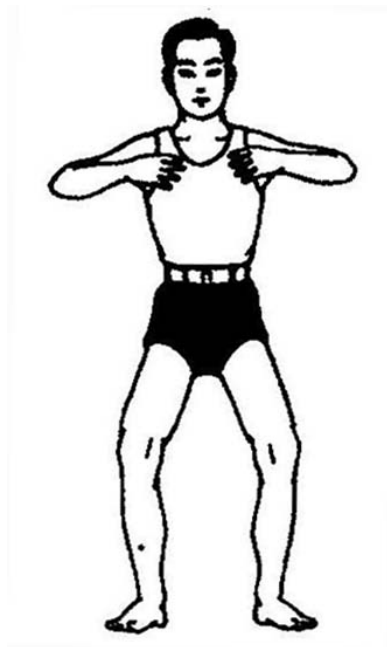




All Healing posts are respecting these requirements (Figure 3-20).

**Third form: Chest vertical – hands supporting and embracing (Simplified version of Supporting and Expanding Form)**

Both feet are assuming the same posture as the Second Form. Both hands lifted above breast level and under shoulder level, center of palm facing in, all fingers naturally separated, as holding something, shoulder relaxed, do not use force (Figure 3-21).



**Figure 3-21**

**Fourth form: Wresting pushing and supporting (Simplified version of Pushing and Supporting Form)**

Both feet are assuming the same posture as the Second Form. Both hands lifted above shoulder level and under eyebrow level. Center of palm facing out, all fingers naturally separated as pushing and supporting something, relax your shoulders and expand elbows, do not use force (Figure 3-22).

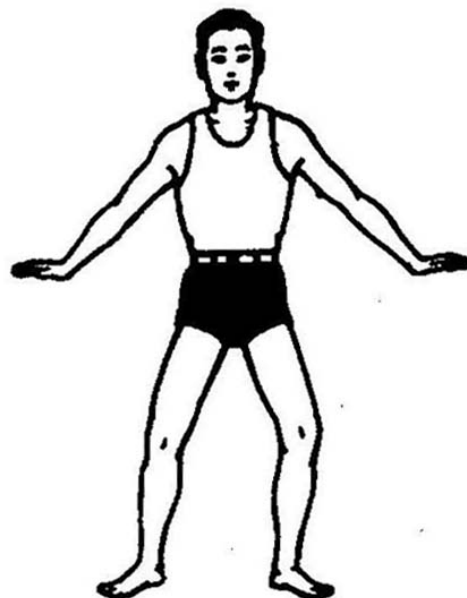


**Figure 3-22**



### **Fifth form: Parting water forward/backward (Simplified version of Parting water Form)**

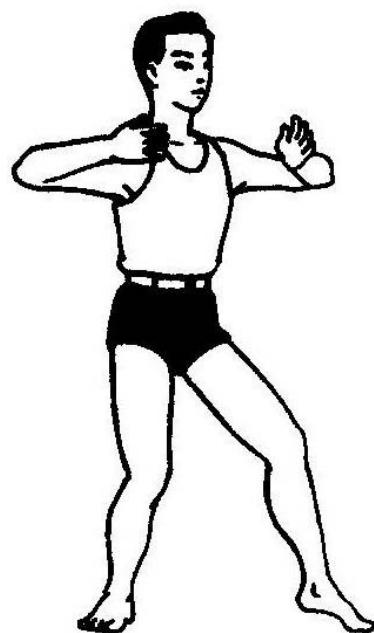
Both feet are assuming the same posture as the Second Form. Stretch both hands to left and right sides at navel level, center of palm facing down or forward. Both elbows slightly bent, both shoulders relaxed, do not use force (Figure 3-23).



**Figure 3-23**

### **Sixth form: T-eight post (also called Small step post)**

Both feet assuming a comfortable stance, front foot moves outward 5 to 10 cm, both feet keeping half T-eight posture. Body slightly side facing, both legs slightly bending, body sitting backward, front heel lifted, the knee pointing forward. Body weight remaining 40/60 distribution on the front/rear legs. Lifting both hands at shoulder level, bending elbows and embrace, center of palm facing in or forward, all fingers naturally separated, relax shoulders and expand elbows, eyes looking forward (Figure 3-24).

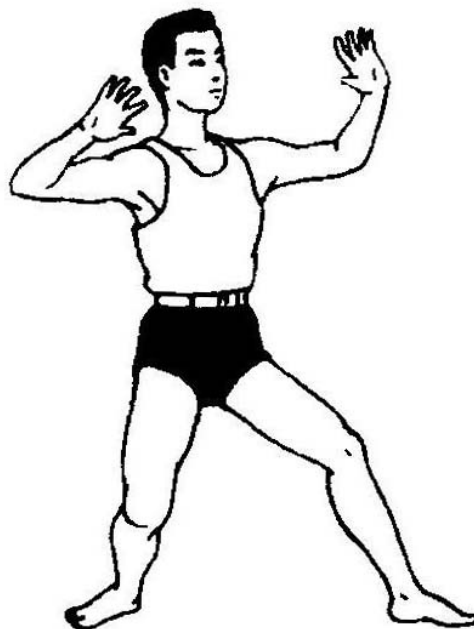


**Figure 3-23**



### **Seventh form: Taming tiger post (also called Big step post)**

Both feet assuming forward and backward a large step, front sole stepping on the ground, heel slightly lifted, knees pointing forward, hips twisting inward while anus retracted and body leaning backward like sitting down. Legs should use an ascending stretching force. Both hands opening forward and backward, are lifted in front of chest and shoulder, center of palm facing forward as to push and support something or placed at belly level, center of palm facing down as pressing the head of tiger (Figure 3-25).



**Figure 3-25**

### **Eight form: Landing dragon post (or Reverse step post)**

Both feet assuming forward and backward a large step, front sole turning out, heels twisting inward and knees bending. Rear leg straight and heel on the ground. Upper body is leaning forward; most of weight is placed on front leg. Front/rear weight distribution starts with 60/40 and gradually changes into 70/30. Twist body backward and head as well with eyes watching rear heel.



**Figure 3-26**

In this example: left front leg, right hand raising up, center of left



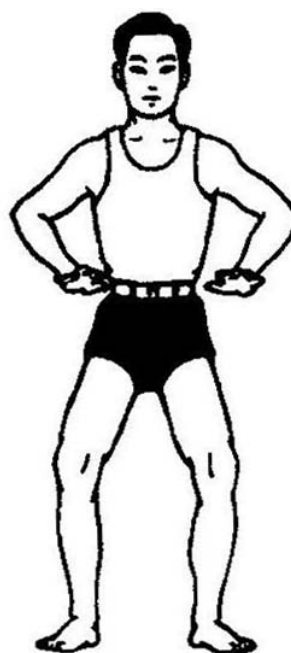
palm facing up, left hand dropping, center of left palm facing down. Both elbows bending as pushing and pressing something (Figure 3-26). With right front leg posture just interchange left and right hands posture but both elbows remain unchanged.

### *III.3.3 Four limbs standing posts*

Four limbs standing posts require comparatively larger physical strain at the extremities of four limbs. Especially when you use simultaneously mental activity to increase the power involved in such as straightening head, hand holding bosom, both elbows expanding, legs stretching upward, feet kicking down, soles trampling on the ground, heels slightly lifting, hip tightening, knees pointing out, body leaning backward, fingers straightening and palm supporting, wrists turning outward etc... These mental activities request a very large amount of power in wrists, fingers and both legs etc... These posts and mental activities associated should be only trained after successful practice of basic posts. During your training, you should pay attention to allow only your four limbs extremities to use force with the assistance of adequate mental activity. Avoid your shoulder, back and chest to use force otherwise you will reach suffocation very quickly. Again these postures are not recommended for beginners.

#### **First form: Supporting fingers wresting and pressing post**

Both feet shoulder width separated, both knees bending, hip twisting inward, body leaning backward, knees pointing out, calf stretching up. Place both hands on two sides of belly at navel level, shoulder width, center of palm downward, all fingers naturally separated, your *Hukou* (tiger mouth - space between thumb and index) supporting and round, wrists bending up and palms pressing down, head straightening and foot stamping, shoulder relaxed and elbow expanding (Figure 3-27).



**Figure 3-27**



## **Second form: Supporting fingers – Hands lifting and holding post**

Lower limbs posture and mental activity are same as in the First form. Center of palm facing each other, fingers pointing down, palms supporting and fingers stretching likes supporting and holding something, both shoulders relaxed, do not use force (Figure 3-28).



**Figure 3-28**

## **Third form: Supporting fingers and Hands turning out post**

Lower limbs posture and mental activity are same as in the First form. Center of palm facing out, back of hands facing each other, all fingers naturally separated, wrists bending up and fingers supporting, both shoulders relaxed, do not use force (Figure 3-29).



**Figure 3-29**



#### **Fourth form: Clenching fists and hooking wrists post**

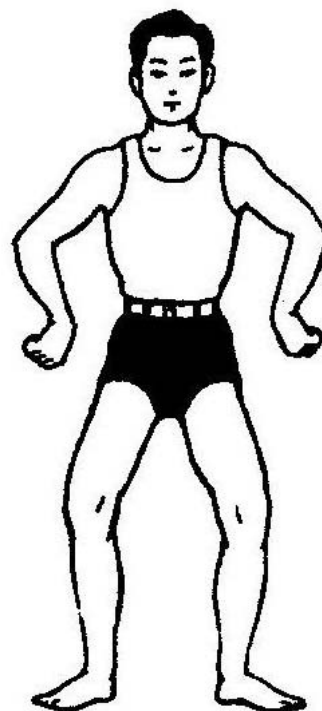
Lower limbs posture and mental activity are same as in the First form. Both fists clenching, center of palm facing up, wrists hooking and elbow supporting, both shoulders relaxed (Figure 3-30).



**Figure 3-30**

#### **Fifth form: clenching fists and turning out post**

Lower limbs posture and mental activity are same as in the First form. Both fists clenching, turning out, back of hands facing each other, wrists turning out and fists hooking (Figure 3-31).

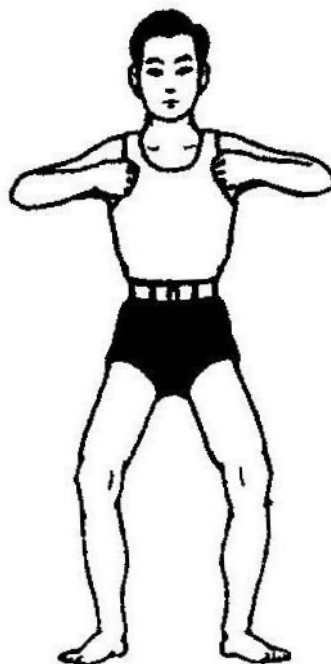


**Figure 3-31**



### **Sixth form: Clenching fists supporting and holding post**

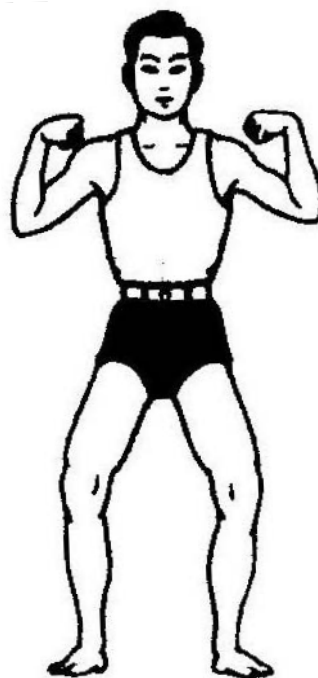
Lower limbs posture and mental activity are same as in First form. Both fists clenching at shoulder level, bending elbow to round your arm, center of palm facing in, wrists hooking and elbow supporting, both shoulders relaxed (Figure 3-32).



**Figure 3-32**

### **Seventh form: Clenching fists and touching shoulder post**

Lower limbs posture and mental activity are same as in First form. Both fists clenching, bending elbows and touching shoulder, wrists hooking down, elbow expanding, both shoulders relaxed (Figure 3-33).



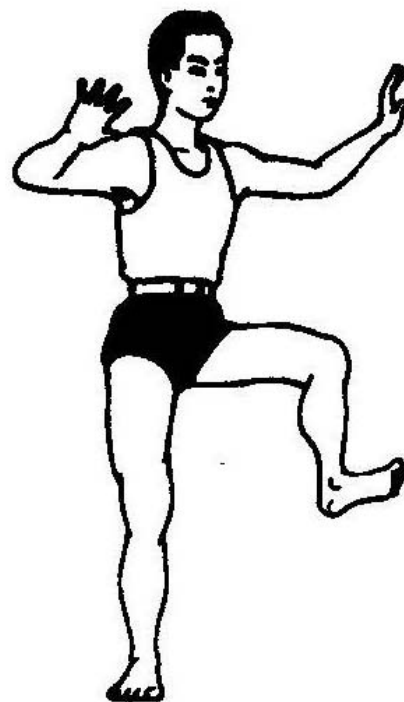
**Figure 3-33**





### **Eighth form: Introspecting deeply on one leg post**

Stand on one leg, knee slightly bending, front leg lifting, toes hooking back, chest slightly withdrawn, head straightening and foot stamping down. Both hands at head level, wrists turning out and fingers supporting, shoulders relaxed and elbows horizontal, back erected and waist straightened, hip tightened and belly inhaling, relax your face and concentrate your mind (Figure 3-34).



**Figure 3-34**



### III.4 Walking posts

Walking exercises are the basic training for Dachengquan steps. Steps are decisive in combat/competition and will even determine the issue of this confrontation.

Let's introduce now the four basic walking exercises.

#### III.4.1 Testing step on the spot

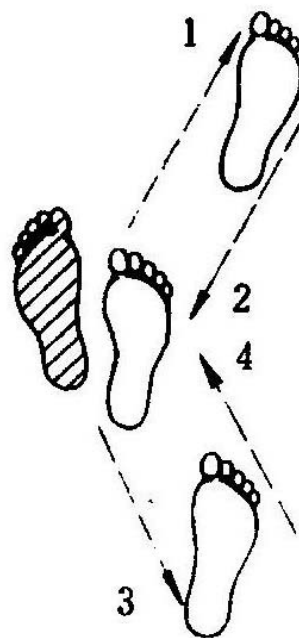
**Testing step on the spot** is the best basic exercise of **Walking posts**. All of further step techniques are just variations/improvements of this basic exercise.

Beginners who do not have good balance, can help themselves by using one hand pressing a wall or a large tree, a desk, a chair or mattress, etc... all kinds of external objects which may assist them to balance, avoiding them for example to lean exaggeratedly forward, etc... The other hand can be stretching out at navel level contributing to keep balance. Progressively the practitioner will gain in strength, balance and confidence: naturally he will not need any assistance in their steps.

#### **Preparative posture**

Stand at attention, both knees slightly bending, all your weight on one leg: it is the *straining foot*. Lift the other leg, sole and heel remaining parallel to ground, at about 2-3 cm distance but not more: it is the *empty foot*. Lifting leg's sole, heel and internal side of knee should be slightly retreated compared to straining foot but both legs are still in contact. Hands placed at both sides of the navel, keep your balance.

Beginners or people with weaker physical condition can use one hand to help themselves such as touching wall and the other hand extending.



**Figure 3-35**



### **First movement (1)**

Empty foot: its sole and heel leaves ground for about 2-3 cm, maintaining parallel to the ground, then slowly making a small step forward and outward, represented by **1** in Figure 3-35, then first sole is touching ground and after heel is touching ground, or sole and heel are touching ground in the same time. You must pay a special attention when you are dropping your foot: avoid touching ground “first heel and after sole”. All your weight must remain on rear leg at this time, you are assuming the Sixth form: T-eight post of Basic standing post. Distance between both feet is around 25-35 cm and not beyond

If you are stepping too far then you’ll be not able to lift back front leg without shifting back head and upper body in order to withdraw front leg.

### **Second movement (2)**

It is requested that head and upper body should not participate to this displacement, not moving; lift slightly the stretching empty leg, and withdraw to its former place according to the previous stretching trajectory, so that both legs are again in contact as in the initial position.

#### **Notice**

When both legs are in contact with each other, it is in fact internal sides of leg (inner sides of heel, knee) which are in contact.

Empty foot should not touch ground; all weight is still on the straining leg. Represented by **2** in Figure 3-35.

### **Third movement (3)**

Empty foot: sole and heel are still maintaining parallel 2-3 cm above ground, make a small step back, sole and heel are slightly touching ground in the same time. Simultaneously all your weight should be still on straining foot, distance between both feet is around 25-35 cm. Represented by **3** in Figure 3-35.

### **Fourth movement (4)**

Same request as in Second movement: head and upper body stay unmoving, slightly lift rear empty foot. During lifting you should pay attention to your sole: your heel and sole should leave ground in the same time, avoid lifting “first heel and after sole”. Rear foot returns to initial position of this exercise and touching again front foot.



Represented by 4 in Figure 3-35.

Now you can start the whole cycle from the First to the Fourth movements until you get tired.

### Notice

a) The most common tendency (and error) is:

- When empty foot is stretching forward and dropping down: use heel to touch first the ground and later the sole is following,
- when lifting foot is lifting from ground: first sole leaves ground and after heel leaves ground;
- when empty foot is stepping back and dropping down: first sole is touching ground then heel is following
- when lifting foot to return back to initial position: first heel leaves ground and after sole is following.

In fact everyone would feel this previous way of dropping and lifting foot as the most easiest and the less strenuous way to do it.

But Dachengquan stepping principle is completely against it.

Because in this way quantity of physical effort involved is the smallest requested to your leg, you cannot use toes to grasp ground, such as a tree taking roots, as a result your sole is like a spring, your ankle shaking and whole body trembling.

Again: practitioner should correct this walking habit: lifting and dropping foot should be executed according to the previous principle

b) When empty foot is stretching forward or retreating back, straining foot should keep fixed bending angle without moving to avoid any up/down trembling movement.

c) When empty foot is stretching forward or backward and dropping onto the ground, you should put all your weight on your straining foot, avoid with determination to shift it on empty foot during this exercise.

Check up the weight distribution by verifying that head and upper body keeps are unmoving during this exercise, lifting/dropping empty foot without shifting weight. At this time although foot is dropping onto the ground, but still all weight remains on the straining foot: we call it **one-leg weight**.

If you are unable to lift your foot without shifting head and upper body then this proves that your weight is already shifted on both legs: we call it **double-leg weight**. Power involved in **Double-leg weight** is relatively small: this is a common general mistake.



You should use your best attention to correct it.

D) When practitioner with weaker body is starting to practice **Testing step on the spot**, due to the strenuous effort requested on one foot, he is generally not able to bear it: swaying left/right with leg uncommonly shaking and even losing his balance.

Under these conditions, it will be not possible at this stage to continue this exercise according to the standard requirements then he should use a way to support in this preliminary step: using one hand to pressing on the wall or a large tree to assure full stability.

### 3.4.2 Post moving steps

#### Preparative form

Post moving steps use the Third form **Vertical chest - Hands Supporting-embracing** of Basic standing posts. Both feet shoulder width separated and parallel. Both knees are squatting down to maintain their bending angle, all weight distributed equally onto both legs. Lift both hands above breast level and under shoulder level, center of palm facing in, all fingers naturally separated, as holding something.

#### First movement (1)

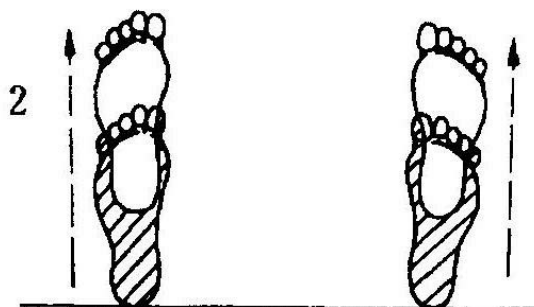
Head and upper body remain unmoving, right foot moves 5-10 cm forward. Represented by **1** in Figure 3-36.

When you are lifting your foot: sole and heel should leave and drop onto ground in the same time

When moving your foot both knees should be always

bent, avoiding any sudden up/down oscillations. When you are lifting your foot: head and upper body should not move, if there is movement then your weight is shifting to the other leg which the very easy trend.

But here we request upper body to remain unmoving, all equally distributed onto both legs, therefore if you want to lift one leg and move forward this is rather difficult.



**Figure 3-36**



We can even say that it is impossible to lift and move forward on a large distance: you should rather train with 5-10 cm forward displacement.

In the beginning as leg muscles are insufficiently trained, it is very hard to keep your upper body without any single movement. So be patient, you will reach it progressively and check regularly your posture.

### **Second movement (2)**

The request here is to use left foot to move 5-10 cm forward as in the First movement, bring both feet again parallel (right foot having already moved). Represented by 2 in Figure 3-36. You can continue to move again according right foot forward as described in First movement. Now you can alternate with Second movement until you'll get tired.

#### *3.4.3 Lower position walking*

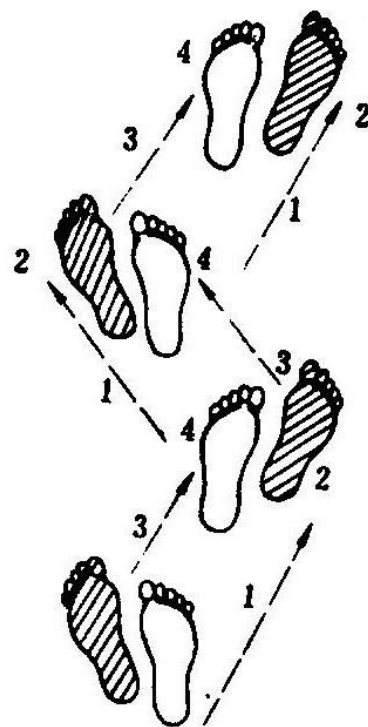
Lower position walking is in accordance with Testing step principle, moving all weight and stepping forward, or moving backward as a Retreating step. All have similar requests to Testing steps.

### **Preparative form**

Standing at attention, both knees slightly bent, both hands opening to both sides at navel level, center of palm facing down to keep balance. Right foot slightly lifting, in contact with left foot and separated from the ground at about 2-3 cm distance. At this time shift all your weight onto left leg. Inner parts of sole, heel and knee (empty leg) being in contact with corresponding inner parts of (straining leg).

### **First movement: Stretch foot (1)**

Empty foot: sole and heel kept parallel with ground, moving slowly and with stability forward/outward for about 20-30 cm distance, sole should first touch the ground and later heel will touch also ground or sole and heel touching ground in the



**Figure 3-37**



same time. Represented as **1** in figure 3-37. At this time all weight still remains on rear leg.

**Second movement: Lift foot to test weight distribution (2)**

Head and upper body remaining unchanged, lift slightly your stretched empty foot and check/estimate if weight has already shifted onto front foot:

- if head and upper body do not move, you can lift and drop easily empty foot forward then it proves that your weight is still on rear foot. In the opposite, if head and upper body need slightly to be moved backward other you can lift front foot then it proves that weight has already moved forward.

This criterion will help you to validate the correctness of your movement. Represented as **2** in Figure 3-37.

**Third movement: Shift weight**

Gradually shift your weight from rear leg to front leg. When you are shifting weight you should pay attention to your body, avoid from up/down oscillation: you should always keep your balance.

**Fourth movement: Lift back foot to test weight**

When all your weight moved onto back leg, remain stable, avoid head and upper body from moving, shift to forward position and lift rear leg. Rear sole and rear heel should lift from the ground in the same time, reaching around 2-3 cm height and maintain parallel to ground. Avoid lifting “first heel and after sole”.

**Fifth movement: withdraw foot and reassemble both feet**

Rear sole and rear heel parallel to ground, represented as **3** of Figure 3-37 move slowly forward and later reassemble with the front (straining) foot. Pay attention to inner parts of empty sole, heel and knee they should reassemble with the other foot while empty foot should never touch ground. Represented as **4** in Figure 3-37.

After a certain moment of rest, again move forward/outward as in the first movement: you are back to **1** of Figure 3-37.

Now you can repeat at will the whole sequence and train forward or backward steps.

*3.4.4 High position walking*

Routine and request are similar to Low position's ones. The difference





here is that when empty foot is stretching forward you should lift high your leg, kicking forward, drop onto the ground and finally shift weight. High position walking imposes a larger amount of physical strain and should be practiced only having completely mastered of Low position walking.

### **Preparative form**

High position walking has the same preparative form then in Low position walking.

### **First movement: Stretch foot**

Sole and heel of empty foot should stay parallel to the ground, make a half step forward.

### **Second movement: Lift leg**

Lift thigh until reaching knee and ankle at the same level while maintaining 90 degree between thigh and tibia. Straining leg should stay stable without any up/down oscillation by maintaining always the same bending angle.

### **Third movement: Turn foot**

Thigh keeping the previous position unmoving, toes are hooking upward and turning outward.

### **Fourth movement: Kick**

Lifting foot as continuing to stretch forward is immediately kicking forward with power. During your kicking foot you should be slightly bend waist.

### **Fifth movement: Drop foot**

Now previous foot can slightly drop forward and outward. Routine is the same as in Low position walking technique.

### **Sixth movement: Shift weight**

Shift weight from rear leg onto front leg. Pay attention to avoid body from any up/down oscillations but always maintaining the same bending degree. Now lift rear foot, hold it off the ground at around 2-3 cm height, moving forward parallel to the ground and reassemble with straining foot. Now you can stretch again foot forward as we describe from First movement: lift leg, turn foot, kick, drop down and shift weight. So now you can practice at will the full sequence of this High position walking forward or backward.



### III.5 Basic testing force exercises

In Dachengquan Zhan Zhuang, Testing force is the intermediate step to progress from **not moving** into **moving**.

Post standing cultivates continuously non-moving training “on site”, but now Testing force will develop this non-moving ability into a moving ability. Testing force is also a method to search the “**Wu**” (object).

Testing force is a very important part of Dachengquan training but also is the most difficulty and most complex to practice correctly.

Wang Xiangzhai in 《The Essence of Boxing》 said about General training program:

*“Outside your body,  
(there is) no Wu to be searched,  
Inside your body,  
You can search it (Wu) endlessly.”*

**What he called “Wu” can be defined as *object, thing* but also *power*. It should be cultivate and develop through Zhan Zhuang, localize and understand its logical distribution through Testing Force, experiment it practically in Pushing Hands and apply it concretely in real combat.**

It is only after acquiring significant basis from Zhan Zhuang that you can develop substantial results from Testing Force.

To give you further insight of this principle we can say that Zhan Zhuang increase (internal) power and collect it effectively then Testing Force gives you the ability to distribute this power and reinforce this distribution artistically and logically.

If you have power but you do not understand how to distribute it logically and how to use it, it is exactly as if a general does not know how to use the power of his army although having the potential to completely destroy his enemy.

If you don’t understand how to collect power and enhance it, you cannot develop yourself effectively and progressively to a high level martial artist.

Testing force is then like a fruitless method without setting up the basis with Zhan Zhuang.



In the other hand, it is also true that if the practitioner knows only Zhan Zhuang but not Testing Force, although it may be very useful for healing and health preservation, he cannot be effective in real combat but just as Lao Zi called an “adept of healing”. Both aspects are complementary.

The founder of Dachengquan, Wang Xiangzhai created an innovative Chinese martial art which differentiates from traditional training of *taolu* (frame) and postures, to emphasize more on post standing, testing force and more generally to the way to search the “Wu”.

During testing force the bending/stretching activity of your hand and foot is not restricted to only the movement of “stretching forward” and “bending backward”, not only restricted to the martial applications included in each movement (which are generally taught as references for better performance of *taolu*), but rather to search in each movement this special “resistance” feeling which is called also “touching something” or “seeking force”.

In Testing Force you should not issue your hand with emptiness and without any mental activity. You should rather feel both hands as *reeling the silk thread off cocoons*, advancing like steel file, retreating like a boathook. Movement should be slow and not fast, force should be exerted continuously without any break. And then you should have the sensation during moving of an imminent stop, during stop of an imminent move.

All these subtle conditions which 《Lao Zi》 has magnificently summarized as:

*“From substantial to unsubstantial,  
Here comes the form.  
From unsubstantial to substantial,  
Here comes the Wu.”*

Concerning “form” and “Wu”: there is a major difference between:

- the one who has a real “internal power”, deep and shallow, performing a movement with an uncommon beauty but also expressing substantiality and roundness,
- another one who, for example, is a beginner, performing the same movement, but without “Wu”, unsubstantial, without soul, without any resistance feeling, which is in fact a mechanic reproduction of limbs/body displacement.



Dachengquan has no determined taolu (frame or sequence of linked movements) or any standard attack/defense sequence. Gathering power and strengthening body request you to maintain Zhan Zhuang but in searching the “Wu”, “Seeking force”... all request you the dynamics of Testing Force. Testing force, Searching “Wu” and Seeking force have also no fixed *taolu* but basic rule and principle.

In Searching “Wu” as well as in Zhan Zhuang practice, you can qualify your exercise with five factors:

- form,
- mind,
- power,
- Qi (here refers to breathing),
- Spirit.

These factors will help you also to improve your practice from shallow to deep, from partial to unified, from internal to external and also from beginner level to Top level, as ultimate indicators of Dachengquan practice.

From Beginner level where it is mostly “upper limbs displacement” and gradually up to a complete unified whole body, you should practice with a same constancy, grasping principles, experimenting uncommon abilities and reaching without real difficulties all types of forms that power can be revealed.

The following section will present all forms of testing force according to basic training method of fixed steps. After having acquired this basis you can combine with steps your testing force form as well train issuing force with step.

Basic testing force training includes upper limbs testing force and lower limbs testing force training methods.

### *III.5.1 Upper limbs Testing force training methods*

Upper limbs Testing forces methods include four categories: Left/right Testing force, Forward/backward Testing force, Upward/downward Testing force and Issuing force.



(1) Left/right Testing force training methods

Left/right Testing force method, according the intensity of mental activity you combine with it can be separated into two methods: **Silk reeling method** and **Pulling accordion** (reference to the movement of “pumping bellows” while playing an accordion) method.

**a) Silk reeling method**

Both feet shoulder width separated. Place both hands on the navel in front of chest, bend elbows in holding position, center of palms facing each other and separated by 17 cm distance about. Both hands are slowly expanding with the feeling of silk reeling: remaining connected and finding permanently resistance. Force exerted by both hands should not have any break (cutting the silk) but you should rather have a connecting feeling between each hand.

After expansion movement proceed to pressing movement:

When both hands have finalized their expansion movement in front of chest and separated now by around 33 cm distance, contract and press inward with both hands to return to the 17 cm distance.

Now you can repeat the complete expanding/pressing sequence while increasing gradually this resistance feeling.

**b) Pulling accordion method**

**Pulling accordion method** is similar to **Silk reeling method** but now you should enhance the intensity of mental activity and power in your movement.

When you are moving you can imagine that you are pulling an accordion (To play an accordion left hand pumps bellows while right hand plays keyboard), here in Testing Force both hands should use force as to “pump bellows” in an expanding/pressing cycle. No matter if hands are expanding or pressing the most important is to imagine the resistance feeling of “Wu”. This kind of resistance feeling goes with your martial power, when it increases then your martial power increase too, but again you need to go progressively.

Besides imagining “Pulling accordion”, you can imagine also that you are pulling a thick silk thread, a thick rope, a thick



spring etc... all similar objects, to increase the physical strain.

## (2) Forward/backward Testing force training methods

Forward/backward Testing force methods include Kneading ball method and Pulling tree method.

### a) Kneading ball method

Assume T-eight Standing post. Both elbows bending and arms embracing, place in front of chest, center of palm facing down, fingers naturally separated, fingertips pointing forward, move slowly forward. Center of both palms is like pressing a big rubber ball floating on water. Imagine this floating rubber ball submitted to the buoyancy force (upward force on an object immersed in a fluid) which is directly communicated to your palms as they are placed while you are pushing forward.

When elbow angle reaches 170 degrees then pull back. Pay attention that avoid completely straight elbow angle (180 degrees). Then both hands are pulling back up to reach 90 degrees as elbow angle at that time both distance between wrists and chest should be around 17 cm and never closer.

Be sure to relax shoulder and supporting elbow.

Repeat this sequence while you can gradually increase resistance feeling in your movements.

### c) Pulling tree method

Kneading ball method is in fact searching the “Wu” inside your body manifested by this resistance feeling.

Once you found it and got familiar with it, now it is time to search the “Wu” outside your body.

You should imagine a target outside your body, at a certain distance, for example a large tree and your hands connected to it. Now imagine pulling and pushing this large tree during Forward/backward testing force.

In the beginning both hands are absolutely empty, unsubstantial, without any feeling, but gradually you will feel like a little resistance in pulling and pushing.

But this kind of feeling is related to each one's martial power.

The more you've got martial power the denser you feel this



resistance. Up to reach the high level where you are advancing like steel file and retreating like a boathook.

### (3) Upward/downward Testing force training methods

**Upward/downward Testing force training methods** include **One up/one down Testing force** and **Scull Testing force**.

#### a) **One up/one down Testing force**

Both feet are assuming T-eight post. Both hands stretching and placed on a same line, bending elbows and arms embracing, center of palm facing down, placed at navel level, palms expanding. Imagine center of palms catching big rubber ball, and lifting it slowly upward, up to eyebrow position then pressing it downward, one ascending movement and one descending movement as one cycle, repeat this exercise and increase gradually the resistance feeling.

Movements should be slow, you can imagine that you have a heavy object on the back of hand, lifting it slowly up to eyebrow level and then putting it down again while avoiding this heavy object from sliding and getting off your hands.

Once you have acquired strong basis with **One up/one down Testing force** then it's time to start to practice **Sway scull Testing force** which comparatively increases the physical strain.

#### b) **Rowing Testing force**

Both feet are assuming T-eight post. Both hands stretching on the same line horizontally, elbow slightly bending, center of palm facing down at navel level, now you start like “propelling a boat by the leverage of an oar” with a rowing movement. Both hands are seizing the oar and moving it backward, upward, forward and backward: this wheeling movement characterizes the **Rowing Testing force**. Shoulders should be relaxed. Increase gradually the resistance feeling in your movements.

### (4) Issuing force method

After sufficient time practicing **Rowing testing force**, the





resistance feeling that you find in it is now substantial then you can start practicing **Splashing Issuing force**.

**Splashing Issuing force** helps you in fact to externalize your internal power. Posture and movement are the same then in as Rowing Testing force, imagine that both hands are holding a basin containing water that you want throw as far as possible.

Movement: foot kicks ground, hands like swinging forcefully the water contained the imaginary basin very far in the same use your mind to throw it even further.

During just the issuing force phase, your movement should be fast, but in preparation and returning phase movement should be slow. Gradually increase in **Splashing Issuing force** the resistance feeling.

### *III.5.2 Lower limbs Testing force training methods*

The focus of Lower limbs testing force training is to strengthen contraction/relaxation ability of foot and shank muscles. It is in fact an answer to the general saying “information relies on how foot is stamping”.

For any normal human being, leg and foot provide supportive function for the body but also are essential for movements such as stepping and lifting leg, walking and running, jumping and squatting etc... but also all kinds of movements with bending and stretching limbs and body displacement.

For every movement, in normal situation, just one part of all your muscles is really involved in the contraction/relaxation process, all these “active” muscles are called “working muscles”.

What about the others muscles? Most of them are resting so we call them “resting muscles”.

Lower limbs Testing force is in fact mobilizing muscles of leg and foot which where originally in resting state, requesting them to increase contraction and stamping intensity within a determined physical training.

During this training, you should deeply concentrate your mental up to its highest degree, use your mind to control consciously these resting muscles and request them to perform contraction/relaxation cycles, in the same time to develop in your cerebral cortex new conditioned



reflexes related to the excitation of these resting muscles, up to the level where they will simultaneously burst powerfully under the slightest solicitation.

### **(1) Shank contraction/relaxation method**

Shank contraction/relaxation method is strengthening shank and foot muscles, improving considerably their responsiveness, elasticity and power best basic training method: this is the very fundamental brick with which you will start to set up the Second kinetics of physical exercise in your body.

Any posture of Healing post and Combat post can be coordinated with Shank contraction and relaxation method to training.

Let's take an example: Healing post (same as Figure 3-21).

Chest slightly withdrawn and hands expanding/embracing, hold your posture without moving. Now use your mind to control and order consciously muscles of front and back shank to contract just once and after relax, after resting, contract again once with power and relax again. You can after repeat alternate between contraction and relaxation.

Practically speaking, ordinary people can begin with 10-20 cycles and after need to rest because above this limit continuing training has no meaning anymore: muscles may not respond at all anymore.

It is only through persisting daily in post standing that you can gradually increase to 50-60 cycles. With stronger physical condition you can reach 100-200 cycles, 400-500 times and even 1000 cycle without feeling tired.

Let's go deeper in Shank contraction/relaxation method:

#### **a) Single shank contraction and relaxation method**

Single shank contraction and relaxation method requests you to use your mind during post standing, i.e. use your cerebral functions to command one of your shanks to contract and relax. First let Left shank is resting, Right shank proceeds to 10-20 cycles of contraction/relaxation and after pause, proceed again to any series of 10-20 cycles. When you feel with Right shank muscles, this time with contract/relax with Left shank



while Right shank is resting.

b) Both shanks contraction/relaxation method

Here both shanks should contract and relax at the same time, working shank muscles of both legs.

It may seem trivial but in some cases it requires your special attention.

When you start practice it you may rather put naturally your attention on Left shank and forget Right shank, then care more about Right shank and forget about Left one.

In a word you may observe instead that shank muscles may not respond to mental excitation as well as you might expect them.

After a period of regular training you will be able to order one side or both sides at will: it is a very positive sign of progress.

c) Alternate contraction/relaxation method

Alternate contraction/relaxation method brings you further in strengthening nerve signal function between Cerebral Cortex and shank's muscles, building up a better signal excitation process.

Example 1: Assume your post standing, first Right shank's muscles are contracting forcefully once, after relax, now it is Left shank's muscles which are contracting forcefully once. You can now alternate Right and Left shank.

Example 2: Assume your post standing, first Right shank's muscles are contracting forcefully once, after relax, but now Left shank's muscles which are contracting forcefully twice. After relaxation again Right shank contracts forcefully once and after Left shank is contracting twice again.

Repeat to alternate Left/Right but with the same number of cycle for each side.

Through repetitive cycles of contraction, you train your brain to improve its control on shank muscles: fast switching, less errors, growing power of contraction, by alternating both sides you reach a higher freedom in the contracting process.



Below is represented the Table which can suggest you a progression in alternating contraction/relaxation on both sides.

**Progression Table of Left/Right contraction (cycles)**

<b>Left leg</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>.....</b>
<b>Right leg</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>.....</b>

**d) Contraction/relaxation speed**

Contraction/relaxation speed is the training which focuses on the duration contraction/relaxation during your exercise.

Fast contraction/relaxation compared with Slow contraction/relaxation is comparatively easier to perform, then Permanent contraction is even more difficult, it requires a certain level of endurance. For a beginner it is very easy to feel stressed by this exercise, therefore this exercise is not suitable for seniors and patients.

Fast contraction/relaxation method:

50-60 cycles/minute with shank resting muscles.

Slow contraction and relaxation method:

20-30 cycles/minute with shank resting muscles.

Permanence contraction and relaxation method:

3-6 cycles/minute with shank resting muscles,  
and then prolong gradually the “contraction” time  
(which is also reducing contraction frequency).

**(2) Squat and kick method**

Squat and kick method trains leg muscle contraction/relaxation in upward and downward movement. All healing posts can be coordinate doing slight squat and kick foot.

Now let's start with Expanding and Embracing post standing (figure 3-21) for example: after assume posture, body slightly leaning forward, heel slightly leaving ground, all your weight placed on your soles, squat: (from normal standing) lower hips for about 5-10 cm, and after both soles average stamping with equal force on the ground, raise slowly, after a little rest, squat again, stamp and stand up.



You can repeat now this squatting/standing exercise until you'll get tired.

Pay attention that in your squatting/standing movement to keep the trunk vertical, do not bend waist, nor stick out belly.

In the beginning start each session by squatting 5-10 times and gradually increase to 20, 30, 50 times or even more.

### **(3) Lean and kick method**

Lean and kick method trains shank muscles contraction/relaxation in forward-backward movement. This is an important training method to set up your basic preparation for Issuing force movement.

Example: Let's start with T-eight standing post (Figure 3-24).

Assume your posture, use your rear ankle joint as principal axe, to slightly lean backward and descend/sit for about 5-10 cm (below normal standing), all your weight placed onto rear foot.

Now rear sole and calf muscles are stamping forcefully and kicking on the ground, propelling slowly your body forward, back to its starting position. At this time front sole tramples and kicks forcefully, shank is lifting and pulling upward, knees should be pointing forward. Keeps both knees expanding, hip twisting inward, belly slightly withdrawn and anus retracted, avoid from bending waist, do not stick up buttocks, trunk vertical.

Repeat this leaning, sitting and kicking exercise until you'll get tired.

Beginners cannot fulfill all these requests, they should only practice slightly Lean and kick exercise and correct gradually their posture, deeper their mental activity as a very good basis for Issuing Force movement.

### **(4) Rise, squat and kick method**

Rise, squat kick method is based on Squat and kick method but with larger amplitudes in squat/raise movement.

Beginners can train raise-squat exercise 10-20 times before or after post standing, increase gradually up to 100-200 times.



In raise-squat movement the more slowly you are performing it, the more difficult it is to perform it correctly.

Raise-squat speed should be around 30-40 cycles/minute and decrease gradually down to 10-20 cycles/minute or even less.

Both feet are separated by distance larger than shoulder width, both hands raising horizontally, stretching forward, center of palm facing down, maintain in their original posture unmoving. Now both knees are bending and squatting down, try your best to keep waist vertical, until your buttocks touch heels.

Repeat squat/stand cycle until you'll get tired. Movement should be slow not fast, when you are squatting should try your best to keep both hands posture.

After sufficient training when you are raising up, you be able to involve both legs and both feet in lifting, holding, supporting, pulling and kicking with substantial power: this will increase spring force and resistance of leg and foot group muscles with is a very good preparation for Pierce and kick technique.

### **(5) Pierce and kick method**

The traditional name of Pierce and kick exercise is Divine Turtle emerging from water it is in fact a combination of pierce, raise, squat and kick exercise.

Difficulty comes from the large amplitude of movement involved. Pure raise/kick movement is relatively easy to execute, but when you include wrapping, supporting, pulling, lifting, holding, kicking, trampling, screwing with silk reeling effect it becomes quite difficult to execute, being out of reach from a beginner.

In raising/squatting movement you should seek for the resistance feeling. But having this resistance feeling in lower limbs is also difficult and we will explain later in this book, how sensory information processing in our cerebral cortex is much developed in for upper limbs than for lower limbs (Somatosensory areas).

During your post standing (front foot and rear foot), place weight onto rear leg. Both elbows bending, both hands stretching horizontally, center of palm facing down, placed in front of chest. Both knees bending and squatting down, both hands should be raising. Body sitting down, hand raising. Hand and leg use



opposite up/down force direction. Shoulder should relax, fingers expanding, both hands are like holding something. Raise when buttocks touch heels, during this time both hands are pressing downward.

When whole body is raising both legs should be in the same time like piercing, wrapping, expanding and pulling, lifting, holding, kicking, trampling and having silk reeling feeling.

Whole body should be slightly expanding, wresting, swinging and swaying horizontally, your spirit as a “Leopard in fog” (c.f. The Essence of Boxing). Head should keep straight, foot kicking, both hands as pressing a high balustrade as to watch a scenery in the yard.

First train as we just indicate previously, then naturally you will feel that in your body the “Wu” growing.

#### **(6) Direct Raise and squat method**

As previous exercises are relatively difficult to perform immediately right especially for the lower limbs, it is certainly not easy for the beginner to grab something in the early stages.

Then this following complementary exercise may help him a lot as it simplifies the overall movement.

Direct raise and squat is an exercise for anyone requesting just raising and squatting, convenient also in daily life.

In physical training, one of most effective method is to strengthen first power of leg muscles and enhance their agility.

In Dachengquan’s lower limb testing force training, it is certainly Divine turtle emerging from water which is the most difficult.

Even the basic request of piercing kicking movement is already a first substantial technical barrier to overcome.

It is only on this basis that leg muscle can acquire larger endurance so that you can start to add further techniques within Divine turtle emerging from water, hand and foot coordinating with each other to achieve a unified body’s testing force movement.

But you should remember that: Direct raise and squat movement is easy to execute, almost everyone can do it. During Raise and Squat exercise, increase your upper and lower limbs resting





muscle contraction/relaxation intensity through deeper mental activity, achieve hand/foot connection, upper/lower limbs full synchronization, muscles unified as one, and among these *Obtaining the “Wu”* is the most difficult, without a rigorous and technical training it is very hard to reach it.

Both feet are separated by distance larger than shoulder width. Both hands stretching horizontally at shoulder level. Both feet are bending knees and squatting downward just once, and after directly raising also just once.

Movement should be slow and never fast. Although doing it fast is rather easy to do, but slow movement is not so easy, you should repeatedly train squat/raise. Accordingly to one's physical condition you can for example start with 10-20 cycles in each training session and gradually increase to 50-100 times, until you'll get tired.

This exercise simple but efficient to build some good basis, very suitable for beginners.

### **(7) Raise and squat with partition**

**Raise and squat with partition** requests you to execute previous **Raise and squat** single up/down exercise into two, three, four even five distinctive sections.

For example during squatting downward movement, you can interrupt your movement on halfway, and then raise, in order to train nerves over this special section of the complete movement: improving local nerve sensitivity and legs strain.

In the beginning use a small angle in bending during the first section, but increasing it progressively up to have buttocks touching heels before raising.

Both feet are separated by distance larger than shoulder width. Both legs in standing position, squatting downward, knee slowly bending, the slower your movement is the better it is, once you reach halfway then stop during a short time and then stretch slowly both legs.

Now you can repeat this section of exercise. You will gradually increase both knees bending and sitting angle, in order to increase both legs strain.

Both hands stretching horizontally, center of palm facing down



placed at shoulder level, both elbows slightly bending. During both knees are squatting downward and bending, both hands are slowly raising up to a higher level than head. When both legs are stretched, both hands are pressing down, hand and leg moving with opposite directions. When both legs are complete stretched, both hands can freely sway upward/downward, forward/backward as to continue upper limbs training during lower limbs rest.

The number of cycles both hands can sway depends on each practitioner's physical condition, strong body can sway just 1 to 2 cycles then rest before resuming exercise, weaker body can sway 4 to 5 times then rest lower limbs before resuming exercise.



## IV. Apprehending physical strain in Zhan Zhuang

### IV.1 Is it better to train Upper limbs or Lower limbs Basic testing force exercises?

To answer this question, it is necessary to understand the basis of limbs functions.

#### *IV.1.1 Anatomical comparison Upper limbs/Lower limbs*

##### A Bipedalism

Anatomical changes believed to have first taken place between 3 - 5 million years ago that provided for a division of labor between the limbs.

##### 1. Upper Limb

- a. Primarily structured for mobility and manipulation
- b. Lost adaptation to support weight (weight bearing) and/ or locomotion

##### 2. Lower limb

- a. Primarily structured for locomotion and weight bearing (support)
- b. Slight ability to manipulate
- c. Humans and other hominids are able to stand upright on and move about on 2 limbs



## B) Anatomical Features

1. Upper Limb
  - a. Modified for movement and manipulation
  - b. Scapula - designed to allow maximal movement of the upper limb
    - i. close to the midline
    - ii. points outward
  - c. Hand
    - i. Manipulation
    - ii. Position of 1st metacarpal
    - iii. Opposition of the thumb
2. Vertebral Column
  - a. Lumbar curvature
    - i. Weight bearing and transmission
3. Lower Limb
  - a. Modified for weight bearing & locomotion
    1. large sized bones
      - i. Femur , tibia
  - b. Joints
    1. Close pack fit
    2. More limited range of motion
  - c. Pelvis
    1. Comprised of 3 bones
      - a. Ischium - short  
Striding gait
      - b. Ilium - broad, flat, flared  
attachment of hip stabilizing muscles
  - d. Foot
    - i. Weight bearing arches
    - ii. Size and shape of big toe

### *IV.1.2 Brain mapping for Upper limbs/Lower limbs*

In the rearmost portion of each frontal lobe is a **motor area (Primary Motor Cortex)**, which helps control voluntary movement. Just behind this area, in the front part the parietal lobe, is the **sensory area (Primary Somatosensory Cortex)** which also receives information



about temperature, touch, pressure, and pain. See Figure 4.1a (next page).

The **sensory** and **motor areas** communicate with each other to control input of sensations from the body and to take appropriate motor action. Planned movements are controlled by the **motor area**. Our motor area sends signals down nerves to our muscles to tell them to move. Delicate movements need more brain power than big ones, so our lips and hands have larger areas of the homunculus controlling them than our legs. Because the left side of our brain controls the right side of our body, every time we want to move our right hand it is our left brain that is doing the work. Conversely, every time we want to move the left side of our body, it is the right side of the brain that controls it.

The body is “mapped out” on the surface of the brain in an image called a homunculus (or “little man”). The head and hands have the largest areas near the midline on the sensory and motor strips. The trunk of the body and legs are represented more laterally (away from the midline). Ref. Figure 4-1b.

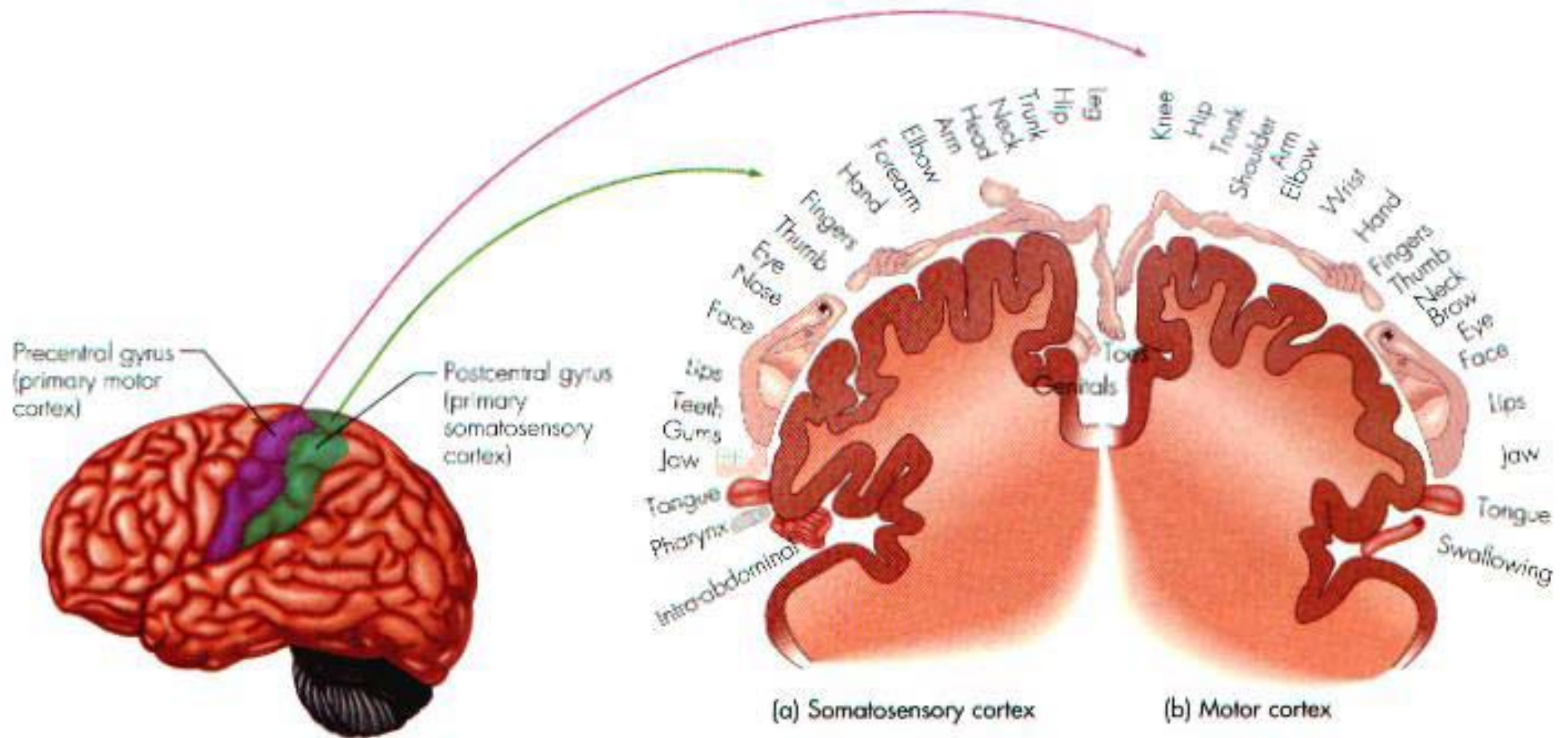
The ability to detect cold, hot, pain, and pressure helps us survive. We have sensory nerves that run from our skin and muscles to our spinal cord. The messages are eventually carried to the part of our brain called the sensory area. It is here that our brain interprets these messages. If we burn our left hand, it is our right side of the brain that recognizes it as pain, and signals a response to the hand to move, by way of motor neurons.



Figure 4.1b

The following activity

“Homunculus or the ‘Little Man’ Role Play” is designed to illustrate how messages are transmitted from the body to the brain and then followed by appropriate actions. The activity involves the whole class and, after some practice, is characterized by its speed and interactions.



**Figure 4.1a Approximate representation of sensory and motor information in the cortex**

(a) Each location in the somatosensory cortex represents sensation from a different body part. (b) Each location in the motor cortex regulates movement of a different body part. (Source: After Penfield & Rasmussen, 1950)





#### *IV.1.3 Training Lower limbs in Chinese martial and healing arts*

There are many old Chinese sayings such as “People are getting old first from their legs” or “You can read age from leg”, etc...which are all relating legs to health and longevity.

In fact it is deeply hidden in Chinese tradition that the secret of health and longevity secret is in a daily foot practice.

In Chinese martial arts circle it is said “fist is 30% of strike, foot is 70%”, but also “when hand reaches then foot should also reach”, “strike your enemy as pulling grass”, “if hand reaches but not foot, then your fist is not radiant”. There are also other sayings concerning power, such as “rooting from foot, issuing from leg, controlling from waist, expressing with fingers”, etc... all insisting on the foot/leg decisive importance: in real combat lower limbs have their major importance for the final issue, foot prevailing on hand.

From the dissection of human body and its analysis it is proven that lower limbs’ weight is around three times of upper limbs’ weight.

For example, for a body weight of 59.70 kg., head counts for 4.1 kg., trunk for 25.0 kg., lower limbs for 22.8 kg. and only 7.6 kg. for upper limbs.

In our experimentation we confirmed that post standing bending leg’s effect is much bigger than lifting weight with hand in terms of heart rate increase.

We know that the largest muscles of the body are the **Quadriceps femoris** or Gluteus maximus, but in the same time in the Primary Motor and Somatosensory Cortex, areas allocated to legs are smaller than those allocated for hands, allowing less refine management in their movements.

So there is a contradictive where legs have comparatively more power and endurance but less precision than hands.

From this consideration, it is easily understandable that through an adequate training of lower limbs we can use their larger potential of power generation to recondition physiologic changes and strengthen the body with much better effects than with hands training.

So Dachengquan is precisely advocating first lower limbs training: the effects are then impacting the whole body **bottom/up** compared with the traditional and conventional method which focuses on upper limbs so that the effects are rather **top/down**.





After successive generations of martial artists researching on the most efficient to build their fighting abilities, a few of them understood that the effects of this body conditioning are rather similar to a pyramid which we start building from the basis or roots (and not starting from the top).

Therefore Dachengquan's "ascending" training is first focusing on the "roots" of the human body and raise progressively to upper level as followed: feet, shanks, thighs, buttocks, waist, chest, back, shoulders, neck, elbows and finally hands.

This ascending training method provides fundamental changes in the practitioner's internal and external body, improving physical condition and nerve system, enhancing his physiologic functions and finally answering to the dilemma in using hands or foot.

Traditions may bring from past cumulated experiences some useful patterns of improvement for mankind even in this 21st century and Zhan zhuang is one of the most impressive examples.

To conclude this paragraph we will mention another old saying from martial artists: "In Boxing a teacher is (generally) not teaching step, if he teaches (steps) then he may be defeated by his student".



## IV.2 Classification of physical strain

Many prescribed medications may pose the risk of drug side effects ranging from mild discomfort to serious health risks.

Common drug side effects can be dry mouth, headache, stomachache and weight loss or gain. Most of these drug side effects are harmless and temporary. However, some drug side effects are serious health risks and may cause lasting or long term damage.

With Zhan zhuang, physical training comes from the internal activity of post standing.

This physical training requires the fine tuning of the amount of physical strain on which the practitioner can build his Zhan zhuang training program, from beginner level up to the highest level, increasing gradually the physical strain in his exercises.

This fine tuning is a sensible point which you should pay a constant and careful attention. In one hand, if the physical strain is not sufficient then you may not get the expected benefits. In the other hand, if you are overtraining you may hurt yourself and be forced to interrupt your training...

Finally these extremes are the boundaries that we want to avoid so let's see more details about setting up the right level of physical strain in your training.

### *IV.2.1 Insufficient level of strain*

It is only through conscious stimulation of nerves and muscles that the practitioner will obtain desired reaction from his body.

This reaction is in fact the contraction/relaxation of muscles involved in training. And from these contractions cycles will appear physiologic functions changes such as blood circulation increase, respiratory and heart rate acceleration, etc...

If the physical strain is insignificant and training time short then you are in the situation of insufficient strain.

The major disadvantage is that it is almost as you are not training at all so that you'll get no obvious results from your training.

### *IV.2.2 Stabilized level of strain*

During post standing, you feel your internal body relaxed and



comfortable, breathing regular, pulse slightly rising: this amount of physical effort is what we call “Stabilized level of strain”. It is to patients, convalescent and old people.

Here stimulation is still in a reduced level but allows controlling better nerve system. This promotes better control of skeletal muscles, a better regulation of cardiovascular and respiratory functions, but also enhancing immune system.

This level of strain is consolidating general physical conditions of the practitioner.

#### *IV.2.3 Incremental level of strain*

During post standing training, the internal body is slightly aching, tingling, swelling.... Bones/muscles are in continuous cycles of contraction/relaxation activity, pulse and respiratory rates are keeping a steady growth on a long period of time. This is the Incremental level of strain.

You can feel very obviously how your body is stimulated and how physiological functions are changing, in the same time this is the best condition to get curative regenerative effects for the body.

#### *IV.2.4 Excessive level of strain*

If physical strain is exceeding what your body can decently bear, you’ve reached the “Excessive level of strain”.

During your practice, you will feel as unbearable pains in joints or muscles. Even after your training session you may feel particularly exhausted, temporarily impotent, insomniac, losing appetite, slow to recover etc...

#### *IV.2.5 Declining level of strain*

Nerves and muscles require from patient to be continuously stimulated in order to maintain the targeted changes in physiologic functions. If during your training program, you interrupt it for any reason, then as your internal body is less stimulated (bones/muscles stopping contraction cycles) and changes of physiologic functions are decreasing with the length of this interruption.

You can easily verify this decline of physical condition when in a same posture you will experiment aching, tingling, swelling as in the beginning level.

From these five levels of physical strain, you can qualify the physical



straining as you progress in your training program.

For example in your beginning level Zhan zhuang's levels of strain with both legs squatting down and bending:

- ◆ 2 cm bending angle is the Stabilized level,
- ◆ 4 cm bending angle is the Incremental level,
- ◆ 6 cm bending angle is the Excessive level.

Later with regular practice 2 cm is no more effective to bring any physical strain, and then you have the following levels:

- ◆ 4 cm bending angle is the Stabilized level,
- ◆ 6 cm bending angle is the Incremental level,
- ◆ 8 cm bending angle is the Excessive level.



## IV.3 Standard criteria to qualify physical strain

In order to define more objectively the physical strain to be targeted in your training program, here are five standard criteria to help you in defining the quantity of physical strain: subjective standard, objective standard, practice time standard and recovery time standard.

### *IV.3.1 Subjective standard*

With this standard the practitioner is evaluating by himself the different levels of stress by subjective impressions in his internal body during his ZZ training.

Checking whether or not he has slight aching, tingling, swelling feelings or having his chest like being oppressed, experimenting palpitation and asthmatic reactions, etc...

### *IV.3.2 Objective standard*

The basic objective standard is mainly the pulse rate (HR). Objective standards should be defined as followed:

- Weak body group: patients suffering from cardiopathy, high blood pressure, elder people and more generally people with weaker body. The request is: in ZZ posture HR reaches 10-20 Bpm more than resting HR times (HR before ZZ). Under these conditions the practice stay safe for them,
- Middle group: most practitioners belong to this group. The request is: in ZZ posture HR reaches 20-30 Bpm more than resting HR times (HR before ZZ).
- Healthy group: this group concerns with good health. The request is: in ZZ posture HR reaches 30-50 Bpm more than resting HR times (HR before ZZ).
- Strong group: here this is addressed to strong bodies such as confirmed athletes. The request is: in ZZ posture HR reaches 50-70 Bpm more than resting HR times (HR before ZZ).

A constant monitoring of level of physical strain applied in your training program is very important: otherwise it is quite easily to fall



in the situation where one's keeps on standing in ZZ with no apparent HR increase, like used to the same bending angle but your nerve system and muscles have adapted to the same level of strain, no further benefits will result from this bending angle.

Time should be constantly adjusted according to your progress and your posture to gain the best effects of ZZ.

#### *IV.3.3 Training Time standard*

In every ZZ training session time session should be defined according to your physical conditions and the type of posture you assume.

For example: a beginner training Holding expanding post can start with 5 minutes and after increase gradually up to 40 minutes, later even up to one hour but never more.

If your training time is too short: no effects to expect, too long: you get exhausted... It is clear that for Large-low posture the training time is rather short (more physical strain) compared with a Small-high posture (less physical strain) where you can train for longer time.

Training time is important, if it can help you in your agenda you can also arrange to train two or three training sessions for a same posture rather than a single long training session.

#### *IV.3.4 Recovering time standard*

After your ZZ training session, your body should rapidly eliminate any internal body reactions intervening during exercise to return to its initial resting state. The time to get back to this resting state is called "Recovering time".

Recovering time is closely related to your physical condition. So this factor can be a quite interesting key to estimate how bearable is the Level of strain you've selected.

For example, if one night resting is not enough to get rid of the physical exhaustion appeared in your last training, then you reached an excessive Level of physical strain and you preferably should reduce it to set up a safer level of physical strain.

In the opposite in after your training session you feel recovering very fast the amount of physical effort may be too light and then you can increase it to gain more benefits from your training.

We just presented the basic principles in qualifying physical strain for a proper training; now let's see more practical method to influence the level physical strain.



## IV.4 Reliable method to quantify physical strain

To reach a precise estimation of a quantity of physical strain in ZZ may be challenging. In addition if we want this precise estimation, ideally we should rather use a metric system to quantify physical strain in ZZ. It proved that the higher is a sport system level, the smaller is the metric reference needed to apply his principles.

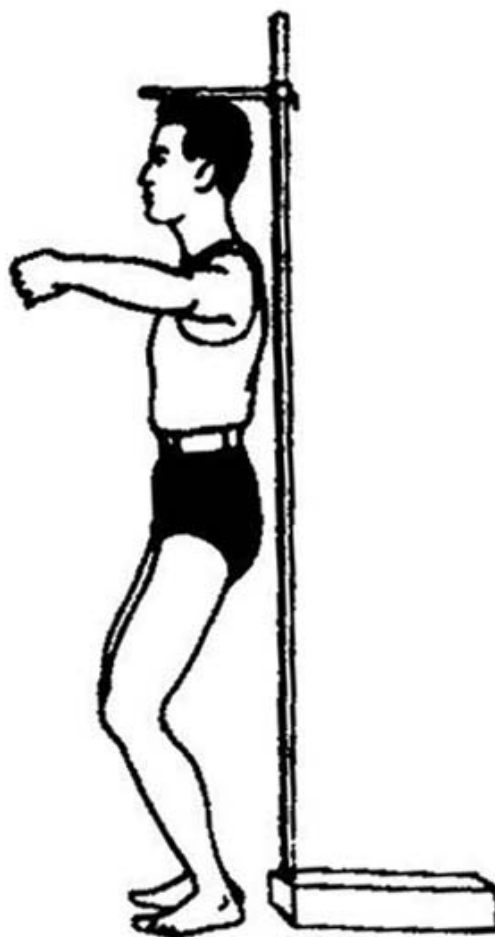
### *IV.4.1 Centimeter-length Stature measurement*

As ZZ requests a fixed bending angle which is in fact a squatting bending degree at knee level. We have frequently used the equivalence between the real angle formed by thigh & shank and the height while assuming ZZ. We just need a height measurement system such as a Height rod (stadiometer) to get your stature precisely.

First in normal standing (straight legs) determine your initial stature position, then shift the headpiece to the lower position as your bending angle and lock it.

Now when you practice ZZ you should top of head touching headpiece at his last locking position.

This is the most reliable and practical way to quantify physical strain from leg squatting. (Figure 4-2).



**Figure 4-2**

### *IV.4.2 Millimeter-length trunk verticality/weight distribution*

After a certain period of practice, your strength has increased then you need further increase of physical strain. This can be achieved





besides adjusting knee's bending angle, by adjusting your trunk verticality. This trunk verticality adjustment inflicts in fact less obvious change in your total posture. In this case it should be measured with a millimeter-length scale.

For example, from a same knee bending angle posture, adjust the imaginary line joining shoulder and hip in order to be perpendicular to the ground plane (90 degrees), if your weight is placed onto the center your soles: physical strain is relatively small, but if your weight is placed onto the heels, physical strain is higher. In this last case, legs are much required to keep whole body balance, you will increase naturally the power involved in shank contraction.

Your adjustment in leaning your trunk backwards should always maintain toes on the ground, when they lift up: you've reached your limit.

The more you are leaning back with weight onto heels, the more you are increasing physical strain (you'll feel it very rapidly). Go progressively and make sure to avoid lowering head, bending waist, sticking out buttocks, leaning excessively shoulders, etc... all these side movements are not correct.

It is evident that this method is not suitable for patients or old people.

#### *IV.4.3 Mental activity's contribution to physical strain – not quantifiable*

Directed from your Cerebral cortex, mental activity is enhancing the control of your nerve system and increasing physical strain through higher level of signal excitation.

When you are assuming your ZZ post, set up your mental activity accordingly, you are now training your resting muscles and exerting the Second kinetics of physical exercise. When you reach a high level in mind/body combination level, although limbs are not executing large movements, but the power, Qi and Spirit involved in, are bringing this exercise into higher level of **strength** which is unfortunately very hard to estimate scientifically.

For example when you are training with mental activity such as "Head erecting", "Holding-embracing", "Supporting shoulders", "Hand lifting", "Leg hooking", "Waist entwining" etc... you can only observe this uncommon power in activity but not measure it...

In these conditions it is also recommended that beginners should first have solid ZZ background before using this way of increasing physical strain.



## IV.5 Form and mind combinations

“Form” refers to the posture angle in your post; “mind” refers to the mental activity. “Form”, “mind” and the uninterrupted training time are the three basic parameters which will help you to define the quantity of physical strain.

We are going to present the six forms of form/mind combination.

### *IV.5.1 Empty mind/ light form*

Empty mind is vacuity from any mind activity; light form refers to a slight bending angle below 10 cm. Upper limbs are also involved in a light bending strain.

This form/mind combination is suitable for beginners for its ability to control power requested in exercise.

### *IV.5.2 Empty mind/ intense form*

After progressive training, you will reach and exceed 10 cm of legs bending degree but still without any addition of mental activity.

### *IV.5.3 Light mind/ light form*

Light mind is addressing to two types of practitioners:

- the first one concerns the patient in medical treatment who is just restraining any mental activity,
- the other type concerns a healthy practitioner training moderately his resting during muscles contraction/relaxation exercise.

If the beginner has difficulties to focus on during his exercise in this case *Empty mind/empty form* is suitable.

### *IV.5.4 Light mental activity and intense form*

When in post standing you are assuming a low limbs bending angle and coordinate it with partial or starting mental activity in his muscles contraction/relaxation exercise, to increase quantity of physical strain. This combination is more suitable for the one who has already good basis and is increasing substantially strain, not suitable for beginners with weak body or patients.

### *IV.5.5 Intense mental activity and light form*



Here you are using high-level mental activity, fully interconnecting body, stretching tendons and pulling-hanging activity.

In post standing, first four limbs bending degrees are relatively small, the combining with mental activity, you are increasing them gradually. This combination is just suitable for healthy practitioners.

#### *IV.5.6 Intense mental activity and intense form*

During your post standing, you are increasing progressively and significantly four limbs' bending angles; in the other hand you are also gradually strengthening your mental activity.

This combination is only suitable for healthy, strong body and experimented practitioners.



## IV.6 Form/Mind/Power/Qi/Spirit Harmony

Post standing has five basic factors to enhance physiologic functions through physical exercise: **Form** (postural angle), **Mind** (mental activity), **Power** (internal martial power), **Qi** (breathing), **Spirit** (spiritual estate). In fact during our ZZ we should be able to harmonize each of these five factors with each other.

This ability to harmonize the five factors is very meaningful in adjusting the quantity of physical strain and in enhancing your general level of practice.

We are going to present some prominent combinations of these five factors.

### *IV.6.1 Just Form – no Mind: an empty form*

During your exercise, each joint is maintaining its bending angle, muscles are contracted without additional mental activity, in a word you are not using your resting muscles into the Second Kinetics physical training. From external point of view your form appears as an “empty frame”. Quantity of physical strain is low. This combination will not bring any obvious effect to a healthy practitioner.

### *IV.6.2 Just Mind – no Form: no way to increase power*

If in your ZZ training you are just focusing on mental activity then your joints’ bending angles are insignificant. As a result you are not involving much physical strain in your posture. In this situation of exclusive Mind, you cannot expect any tangible effect.

There is no other alternative in ZZ: you need to build up a relevant physical condition i.e. a sufficient bending angle in your joints.

### *IV.6.3 Just Mind – no power: a delusion of practice*

We stipulated already that your muscles need to contract with sufficient. If in your training you cannot combine it with adequate mental activity, then naturally you will also not be able to bring to a sufficient level of power.

Just mind – no power is in fact almost no (relevant) mind and body is a resting state. As your bending angle is very small then you cannot



expect any real results for this practice.

#### *IV.6.4 Just power – no Mind: no dexterity*

A practitioner with strong body can involve considerable power in his training, but if he does not combine it with mental activity, his contraction/relaxation process cannot be fully controlled, i.e. he cannot use his power effectively...

To avoid this combination and install a consequent mind activity it is important to start with lower power in your training.

#### *IV.6.5 Just power – no Qi: brutal power*

During muscle's contraction/relaxation activity, the energetic consumption requires more oxygen as we presented in the previous chapters. But as you cannot stock oxygen in the body but just supply it from breathing, it is precisely this breathing function which might limit your physical activity when you are requesting high amount of power in your exercise.

Here is an vivid example: you can use a large amount of power in your exercise but your breathing does not follow the amount of oxygen requested your then you are very rapidly reaching the situation of oxygen dept after exerting your upmost power...

It becomes clear that good cooperation between power exerted and breathing constitutes a fundamental step to increase quantity of physical strain.

#### *IV.6.6 Just Qi – no power: lack of power*

You can find some practitioners who are performing very nicely their ZZ exercise including a good breathing coordination but with a mental activity inducing a feeble contraction of muscles. As a consequence these practitioners can hardly subdue their opponents in pushing hands and in sparring.

Just Qi – no power is clearly not an effective combination.

#### *IV.6.7 Just Mind – no Spirit: not high level*

Even if someone is using a very consistent mental activity where are combining only mind, power, Qi, it is still not fully harmonized.

Because in Zhan Zhuang you need also to reach a wide and natural state of mind that characterize a “spiritual grandeur” which is the highest level of harmonization.



*IV.6.8 Full spirit –full mind: physical body tracked to its peak*

When you practice ZZ at the highest level, your training is not only requesting Form, Mind, Power and Qi harmony but also in the same time harmony with Spirit which differs completely from its common estate, in this level of harmonious plenitude your instinctive abilities are revealed spontaneously such as an extreme responsiveness to even a slightest external solicitation: you'll be able to burst freely an unpredictable and explosive power in combat situation.



## **IV.7 Relation between joint bending angle and quantity of physical strain**

### *IV.7.1 Relationship weight bearing point/physical strain during ZZ*

When you are assuming ZZ you should keep your trunk vertical, not leaning forward and your face not looking upward; the line shoulder-hip should form an angle of 90 degrees with ground plane. It is from this basis that we are going to present the three weight bearing points localized on your sole.

#### **7.1.1 Center of foot as weight bearing point**

During your ZZ sole and heel are touching ground in the same time, total weight put onto the center of sole as weight bearing point. Under this weight bearing condition quantity of physical strain is relatively small and stable. This is a perfect choice for the beginner.

#### **7.1.2 Fore Sole as weight bearing point**

During your ZZ sole is touching ground, heel slightly lifting and leaving ground, total weight put on the front sole as support point. As your total weight is shifting forward to prevent body from falling forward, muscles of thigh and calf must strengthen their contraction to keep balance. You are increasing the physical strain involved in this ZZ.

#### **7.1.3 Heel as weight bearing point**

When post standing, heel and sole touching ground in the same time, body sitting backward, total weight support placed onto the heel and move trunk gradually backward. Here the balance is much difficult to achieve and requests a high contraction of shank/foot muscles to keep balance. Physical strain is much important. This can be a good method to increase gradually strain but not suitable for beginner.

### *7.2 Relationship Sole inclination/physical strain during ZZ*

When you are assuming ZZ with both feet touching ground, your ankle bending angle is one of the different factors that may influence





legs physical strain.

#### 7.2.1 ZZ on flat ground

Post standing on flat ground is the most common way to practice ZZ but also as the most convenient one.

Request is only to maintain the both soles flat on the ground, eventually a surface such as a carpet may help to reduce ground rigidity and hardness.

#### 7.2.2 ZZ with lifted Heel

Lifted heels ZZ can be practiced on inclined rugged (ascending) ground or with a little sandbag place under heels.

Heel and ground forming 10-30 degrees angle so that your sole is the lowest of the foot touching ground.

This method will increase the ankle bending, inducing an uncommon strain on muscles and tendons of legs, shank and foot. The physical strain obtained is comparatively important.

#### 7.2.3 ZZ with (slightly) lifted Fore-part of sole

Lifting Fore-part of the sole is exactly the opposite of previous method. You can train on inclined rugged (descending) ground or with a little sandbag place under fore-part of sole.

This method will shorten the ankle bending, inducing another uncommon strain on muscles and tendons of legs, shank and foot. The physical strain obtained is also comparatively important.

#### 7.2.4 ZZ with lifted Center-part of sole

Lifting Center-part of sole can be trained with a sandbag placed under the Venter-part of sole.

This will increase support arch of the foot, while heels and fore sole are still touching ground and be even used as treatment for flat feet. It to increase both legs' bounce force have stated effect, also help practitioners with flat-footed.

#### 7.2.5 ZZ with hanging Heel

In hanging Heel ZZ you can use two bricks or one step stair to support your heel, fore-part sole touching ground. The higher you are lifting heel, the larger is the physical strain. This method reduces the foot's surface contact with the ground. It results that the surface contact is submitted to more pressure and request



higher power to maintain balance.

It is quite evident that this method requires good basis in conventional ZZ.

### 7.3 Relationship feet alignment /physical strain during ZZ

The relative position of feet has also incidence on physical strain of a ZZ exercise. We are going to present four types of feet alignment.

#### 7.3.1 “V” alignment

A beginner starts generally by standing in “V” alignment.

Both heels are relatively near, separated by a distance around 25-35 cm, in the other hand both big toes distance are comparatively wider. Foot and torso plane are forming an angle of about 50-70 degrees (the general angle is 60 degrees) (Figure 4-3).

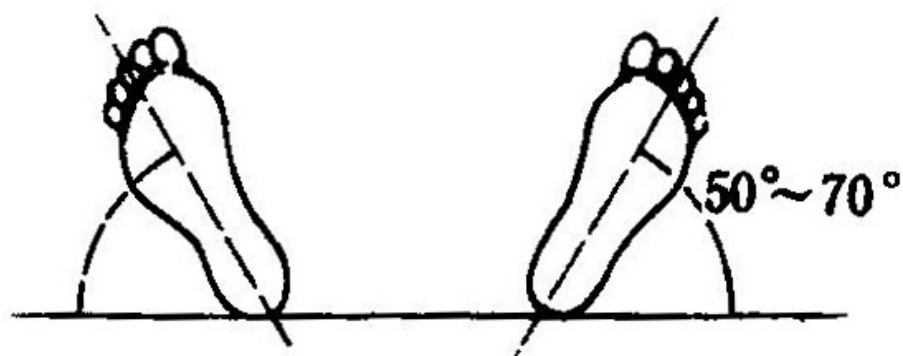


Figure 4-3

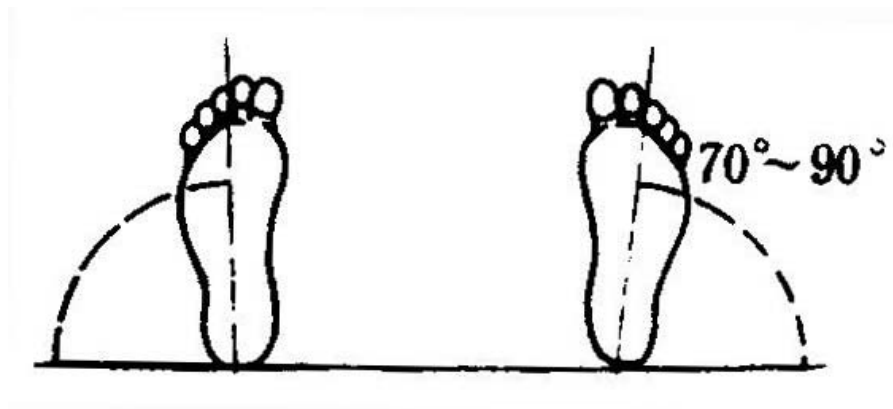
The “V” form step gives a good stability and opens to a larger number of applications.

For example, in **Standing at attention posture** both feet present the best stability in “V” alignment.

#### 7.3.2 Parallel alignment

Parallel alignment of feet refers in fact the lines of the inner sides of both feet. These lines should be separated with the same distance at toes level as well as heel level, around 30-40 cm.

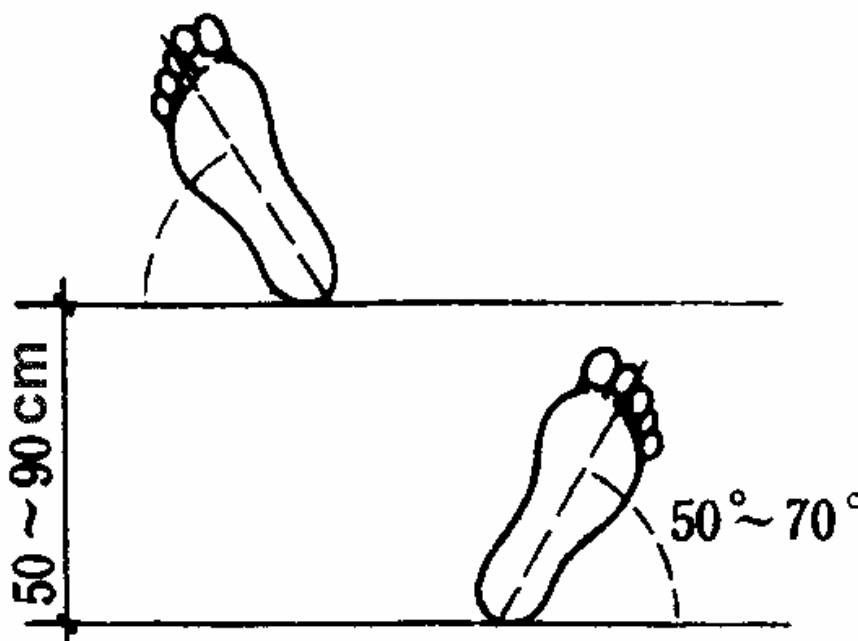
During this time you are maintaining 70-90 degrees angle between tibia and ground. From an external view this change is almost imperceptible but for the practitioner's legs the physical strain has much more increased (Figure 4-4).



**Figure 4-4**

This parallel alignment is, in the beginning, relatively uncomfortable tending to return back to “V” form but also, if you do not pay attention, inducing deformation of posture such as knees brought together into an “X” shape of both legs then depriving your lower limbs from their expansive power: limiting their abilities in stamping ground and issuing force.

### 7.3.3 Oblique alignment



**Figure 4-5**

Feet oblique alignment does not have the same symmetry then in “V” alignment or “T” alignment, but requests one front foot and

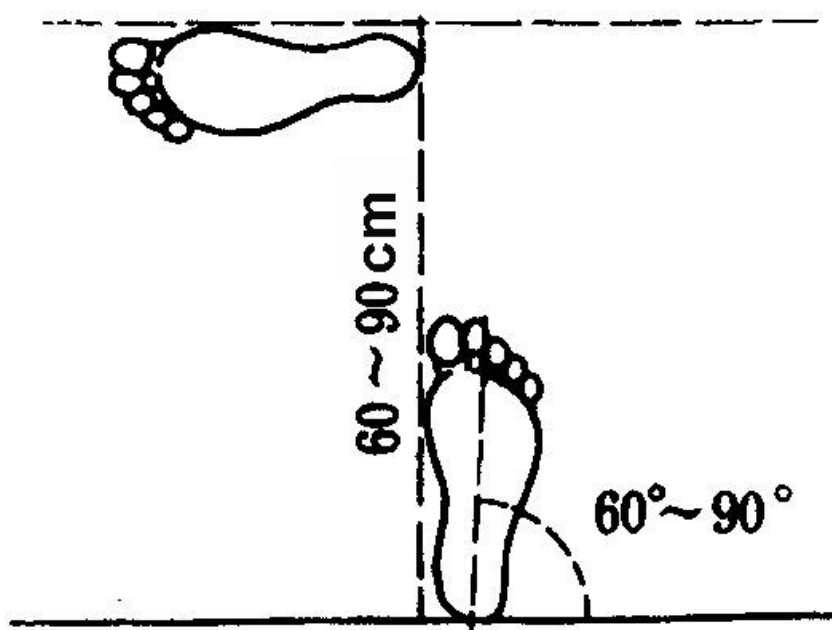


one rear foot. Both feet keeping around 50-70 degree angle.

When you are assuming a Small step post (Sixth form of Basic standing posts) both heels are separated by 50-90 cm distance. The farther you are stretching your Oblique step the more important is your physical strain. Therefore you will progressively feet distance from a **Small step post** up to a **Large step post**.

In this posture as almost all your weight is put onto rear foot, then you are particularly straining your rear foot (Figure 4-5).

#### 7.3.4 Reverse alignment



**Figure 4-6**

Reverse alignment induces comparatively a higher physical strain all muscles of legs involved in the post standing. From T-eight step, twist your front foot in order to have your inner sole facing outward forming with the plane of your torso 0-50 degrees angle. The smaller the front angle is, the larger is your physical strain. Rear heel should not lift ground and forming 60-90 degrees angle with torso plane. The bigger rear angle is, the larger is your physical strain. The distance between both feet is about 60-90 cm. If you increase feet distance this will increase also physical strain. As upper body is bending forward, total weight is mostly put onto front leg, therefore front leg is submitted to a larger physical strain



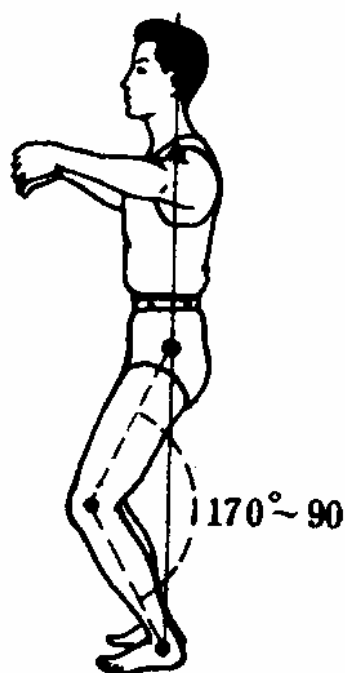
(Figure 4-6).

#### 7.4 Relationship knee/physical strain

When you are assuming ZZ, the vertical line joining, knee, hip, shoulder and ear should be perpendicular to the ground plane (Figure 4-7).



**Figure 4-7**



**Figure 4-8**

With this angle all bones are directly assuming a supportive function, in the same time minimizing the contribution from muscles to keep body erect, as physical strain is quite low you can clearly stay for a long time in this position without feeling tired: no obvious HR increase.

From this same body posture, just modify knee angle descending it to 170, 160, 150... up to 90 degrees (maximum bending angle). The lower your posture is, the more important is your physical strain which you can check through HR increase (Figure 4-8).

#### 7.5 Relationship hips/physical strain

When you are assuming ZZ, you should make sure that your torso is vertical: this is the precondition. To be more precise, the line shoulder-hip should be perpendicular to the ground plane.

Under this precondition, the smaller the hip angle is, the more

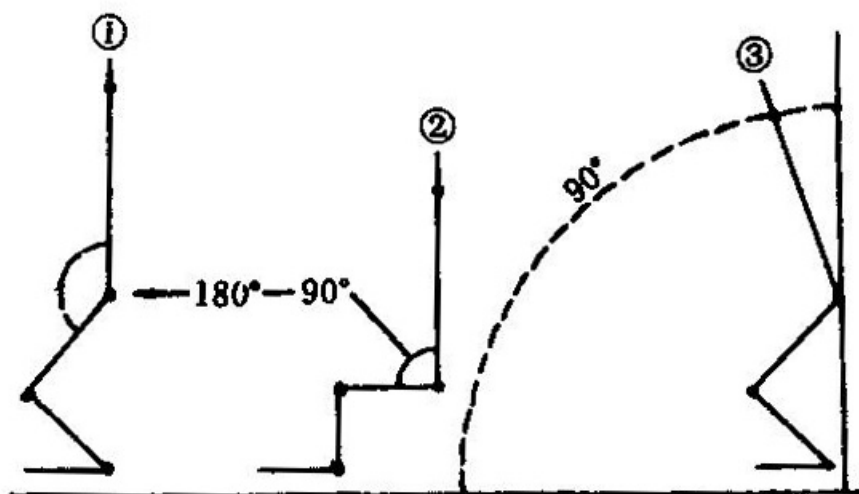


important is the physical strain but never below 90 degrees.

As it represented in **1** and **2** of Figure 4-9. You can notice that **2** in Figure 4-9 is almost impossible to achieve but it gives you an idea of how to increase gradually physical strain with hip angle.

In fact **case 2** is called *Sanping* post or Three plans post. It requests you to have on a same vertical line shoulder, hip and ankle. The line hip-knee should be parallel to the ground. The line elbow-shoulder is also parallel to ground. So there they are your three plans:

- elbow-shoulder plan,
- knee-hip plan,
- ground plan.



**Figure 4-9**

In general you will assume all yours posts bending waist and torso a in **3** of Figure 4-9. So in this case even your hip angle is smaller than **1** but because your total weight is still not exceeding your foot, so the physical strain is still relatively small compared to **2**.

#### 7.6 Relationship ankle/physical strain

Assuming post standing although upper limb maintain the same posture, lower limbs the same bending angle, if the vertical passing through knee exceeds your toe that means that you are reducing your ankle angle (but remaining superior to 45 degrees).

In addition physical strain decreases with ankle angle.

Therefore at the largest ankle angle (90 degrees) you are submitted to greater physical strain.



### 7.7 Relationship shoulder/physical strain

In ZZ depending of the height you are placing your hands you are setting different physical strain to upper limbs.

Now let's consider the angle composed by two lines (arm-shoulder) and (armpit-hip) converging at shoulder.

The smaller this angle is, the lower is your physical strain. This the case for the Second form of Assisted standing posts: **Expanding elbows and lifting hands** where we are suppress much strain in the upper limbs.

But in the contrary when this angle (always below 90 degrees) is bigger you have therefore more physical strain. The Fourth form of Basic standing posts: **Wresting pushing and supporting** is precisely illustrating this situation.

### 7.8 Relationship elbow/physical strain

Assuming post standing, if you have small elbows bending angle in embracing posture, physical strain is relatively small. It should be superior to 45 degrees. An example is the Second form of Assisted Standing posts: **Second form: Dropping elbows and lifting hands**.

In the contrary when both arms are extending: elbow angle is increasing and so does physical strain. An example is the Fifth form of Basic Standing posts: **Fifth form: Parting water forward/backward**.

### 7.9 Relationship wrist/physical strain

Although hand's bones and muscles all relatively small, but they allow us to perform agile and dexterous movements. As we saw previously in *IV.1.2 Brain mapping for Upper limbs/Lower limbs* this can be explain by the large area allocated to hands in our Primary Somatosensory cortex and Motor cortex. Understanding how to increase physical strain from the wrist is also important to define the whole chain of forces in your posture.

Assuming your ZZ, if your wrists are slack and dropping, the physical strain involved is minimized. If you extend your wrists straight horizontally in the continuity of the arms, fingers pointing forward you will increase sensibly the physical strain of wrists.

If you are hooking downward, fingers opened, the physical strain of wrist is even more important then both previous cases.





## V. Zhan Zhuang and mental activity

**Mind** refers to the collective aspects of intellect and consciousness which are manifest in some combination of thought, perception, emotion, will, memory and imagination. The mind is the result of the activity of the brain. Modern technology can actually see which portions of the brain are more functional in relationship to certain thoughts, i.e., the mind, but also to for example sensory and motor information (*IV.1.2 Brain mapping for Upper limbs/Lower limbs*).

**Consciousness** refers to the quality or state of being aware. As applied to the lower animals, consciousness refers to the capacity for sensation and, usually, simple volition. In higher animals, this capacity may also include thinking and emotion. In human beings, consciousness is understood to include “meta-awareness,” an awareness that one is aware. The term also refers broadly to the upper level of mental life of which the person is aware, as contrasted with unconscious processes. Levels of consciousness (e.g., attention vs. sleep) are correlated with patterns of electrical activity in the brain (brain waves).

Mental activity in Zhan zhuang is a conscious activity of the collective functions which refers to mind, but also helps the practitioner to develop progressively higher level of consciousness in collaboration with the specific physical straining of Dachengquan.

To achieve this goal, Dachengquan separates mental activities into two categories: control/monitoring and excitation.

In the beginning of ZZ training: the practitioner should rather use a control/monitoring mental activity, to cultivate his relaxation ability and suppress generation of random thoughts, gaining better control of his cortex-based Central nerve system, especially recommended for medical treatment and healing.

For people with good physical condition, the contraction/relaxation training of resting muscles, increasing the physical exertion during exercise and progressively converting “resting” muscles in “working”. This specific training will gradually strengthen body’s functions and optimize his sensorial information system (human body structure).

Muscles contraction/relaxation in daily movement involve a mental



activity will help to synthesize the complete training process they are submitted to. In the same time this mental activity will also determine what kind of kinetics of physical exertion is concerned by this contraction/relaxation process.

In the very most current situation it will be the First Kinetics physical exercise involving working muscles, it is this category which animals movements are also falling into.

The second category is what I call the Second Kinetics of physical movement which is involved resting working. It is only through rigorous and assiduous training that you can master it.

Involving resting muscles instead of working muscles is fundamentally different and that's what will generate all the major uncommon properties of the Second Kinetics system.

## V.1 Relaxation activity

### *Relaxing mind & relaxing muscle*

Relaxation is a conscious mental activity largely discussed in internal disciplines; however I would like to inform you that the concept of relaxation in Dachengquan is completely different from those you may expect in any other discipline.

Achieving a relaxed state requires much a dynamic training that any common slacking or passive method.

Concrete relaxation process is initiated from the conscious monitoring of some parts of the body, following and examining by yourself the physical exertion produced by each fiber of these muscles.

Progressively through this conscious command of contraction/relaxation of resting muscles, you will improve and refine their responsiveness, contractive ability and of course their relaxation ability.

Once your muscles are more familiar to their deeper relaxation state, in return your brain functions will also improve and understand from their side a deeper relaxation state.

Usually as muscles have not been trained properly and even assuming your ZZ you are not conscious about all contractions and nerve excitation that they are submitted to.

In the contrary if the muscle can relax under shorter and more precise



time, you will gain in endurance and general power.

After shortening its relaxation cycle, it has more time to relax and regenerate itself. This will improve the energy consumption during a similar physical strain and increase its limits.

Applying this theory in post standing, you can rapidly verify that any beginner in ZZ has a very stiff body and can hardly enter any tranquility, as a result he will get tired very quickly.

So in Zhan zhuang, the very first task to execute is to interiorize and inspect all concerned muscles in their relaxation, contraction, even every state of contraction cycle and relaxation cycles. This first approach of relaxation will build up your foundation to further “Entering Stillness”.

From this basis, you can combine with these following relaxation methods with mental inducement:

#### *V.1.1 Mind relaxation*

Mind relaxation is a preparative phase before exercising properly ZZ. It is also recommended that just that before post standing you should try your best to leave out your daily concerns and any emotional feeling.

Mind relaxation also is very important in all the ZZ training process and constitutes the most important path to built confidence and assiduity in your practice.

We all know that reaching durable peace of mind is not something so easy to achieve. Some beginners due to a lack of self confidence will even feel very long only one minute of Zhan zhuang, as their mind is easily distracted and invaded by mixed thoughts or feelings...

In this point they cannot relax their mind and gain a state of tranquility.

But if they can persevere on daily ZZ training, after 3-4 weeks any sensation of soaring, tingling, swelling or pain will disappear and replaced by a broader feeling of relaxation and well being which will gradually stabilize their mental state. At this level each session he will be able to stand 40-60 minutes without feeling the time especially long, he will be naturally be able to focus his mind instead of any previous confusion or unstable state. This is the state of mind relaxation.

Mind relaxation can improve some internal factors that may induced in a long terms some diseases. For example emotional stress overload, affliction, excitability, anxiety, fears etc...

There are various pathologies which are initiated from the mental then



triggered by environmental factors including anticipatory responses to words or other forms of language.

## **Mental deconditioning**

Let's revise the basic principles of conditioning:

### *1<sup>st</sup> and 2<sup>nd</sup> Signal system - Pavlov*

*Many years ago, Pavlov referred to physical stimuli that precede biologically significant events as the First Signal System. Such stimuli allow an organism to anticipate biologically significant events and thus deal with them effectively when they occur.*

*For example, we avoid hot stoves, and we salivate when we are hungry and see food. Pavlov called the first signal system "the first signals of reality". In addition to learning anticipatory responses to physical stimuli, however, humans also learn to respond to symbols of reality. For example, we become fearful when we hear words like "fire", "danger", or "enemy". Likewise, we feel good when we hear the name of a loved one or hear such words as "love", "peace" or "friend". Pavlov called the words that symbolize reality "signals of signals" or the Second Signal System.*

Some disorders are initiated from the mental then triggered by environmental factors including anticipatory responses to words or other forms of language.

As part of our human society, we are daily in contact with potential sources of conditioning (language and method of communication largely used in advertisement...), intruding our life, our emotions and even in our decisions.

All these sources are incessantly growing in number and in intensity. A classic example is the fear of stress and anxiety which was clinically studied with its associated body responses (especially during surgical shocks) such as sudden death or ulcers...

To decondition our Central nervous system, the best alternative is to use simply our most natural response: deeper mental relaxation due to the supportive action of further muscle relaxation and its positive effects of optimism and psychological well-being.

By persisting in Zhan zhuang, you will acquire progressively beside a better physical condition but also a stronger mental which helps to fight again many disorders directly or indirectly induced by these



environmental factors such as stress.

#### *V.1.2 Expression relaxation*

Expression relaxation is another method of mental inducement in Zhan zhuang. As an application of the principle of “second signal system” explained previously you can recall happy memories, situations, impressions, emotions...all which help you to be in a good mood and relaxed. Externally you should be smiling but not exaggeratedly (inward smile).

Why do we request this? From an anatomical and physiological point of view it gives us more rational and obvious explanations. Our Cerebral Cortex will receive signals from facial muscles/nerves which as usually triggered in circumstances of happiness or any expression of good mood including laughing. This is also the reason why one's may involuntarily laugh when we are seeing others laughing during stage performance or hearing a joke. This laughing behavior is in fact a situation when your mental and spirit reach a state of freedom and lightness, at that time you feel your body also very comfortable and relaxed.

By adopting an “inward smile” you will be able to adjust more effectively your mental and your muscles in their relaxation process but also to reach faster comfort and relaxation.

#### *V.1.3 Exhalation relaxation*

During Zhan zhuang, shoulders' muscles are easily submitted to overexcited nerves. To verify it examine your shoulders if they are rigid, local muscles are stimulated. Check if your breathing is deep and natural, if your chest if feel suffocated, etc... If it is the case, first inhale slowly until your lungs are filled to capacity, enlarging your thorax, and after stretch your spine vertically and straight upward, and slightly swaying sometimes leftward or rightward, exhale slowly, at this time shoulder muscles are following the contraction of thorax during exhalation and just naturally relax.

You may use this method every interval of 4-5 minutes and take 2-3 times deep breathing (exhalation relaxation).

#### *V.1.4 Jiggling relaxation*

Jiggling relaxation method requests all joints into tiny movement as to relax muscles.

In Zhan Zhuang although you are requested to maintain a non-moving



posture, but in order to check relaxation in your body, differentiate, compare and understand if local muscles are overexcited, you may use, after an interval of 5-10 minutes, your four limbs into very small upward - downward, leftward - rightward, forward - backward movements, relaxing local muscles and easing respective muscle/bones position within your overall posture alignment.

#### *V.1.5 Active posture adjustment relaxation*

In Zhan zhuang exercise maintaining your posture during 10-20 minutes, part of working muscle may start to feel acid, tingling, swelling and painful, being progressively unbearable: at this time you can drop down your hand, straighten your leg, and slightly clench your fist several times, or rotate your wrist, moving other working joints, changing into another posture before resuming your exercise. This method can be applied by the practitioner accordingly to change in his internal body, adjust actively his posture and relax his muscles.

#### *V.1.6 Passive posture adjustment relaxation*

Passive posture adjustment relaxation method needs the guidance of ZZ experts/medical professionals to check, at any time, correctness of ZZ posture, correcting in time any mistake, and who can also interact with the practitioner by shaking, quivering, supporting, touching, swaying, pulling, etc... as many possible techniques to help him reaching “passively” relaxation. The practitioner may also be guided through vocal instructions.



## V.2 Imagination activity

Using visualization during ZZ exercise refers here to **Imagination activity** or **Recall activity**, it is involving high brain functions from the Cerebral Cortex such as memory, attention... so that the practitioner can benefit a faster internal control/monitoring. It has proven effects on overexcitability, improving mental focus and reducing random thoughts. Among all Imagination activity exercises we selected six most common and applicable ones:

### *V.2.1 Far seeing activity*

**Far seeing activity** combined with ZZ: assuming your post, both eyes looking to an objective, far forward, using the reflexive effects from your visual system nerve to induce deeper mental concentration. If you are standing in your room, you can look some paintings, wallpapers or furniture. If you are standing outside your house, you can look in front of you far away, selecting objective such as flowers, grass, trees, buildings, cloud in the sky, etc....

### *V.2.2 Far hearing activity*

**Far hearing activity** combined with ZZ: listening to a distant sound, you are using the reflexive effects from your auditive system nerve to induce deeper mental concentration. The ancients described it as “concentrate your mind in hearing tiny raining”. You can use radio, TV, tape recorder, etc... listening music (classical, traditional opera...), novel or documentary... while exercising ZZ. This will help you to reduce significantly feeling of endless time, eliminate restless emotions and inducing better mental concentration.

### *V.2.3 Touching activity*

**Touching activity** induces in upper limbs muscles further relaxation without using force. Weaker body practitioners and beginners can place both wrists on a suitable furniture or balustrade with suitable, therefore reducing upper limbs’ physical strain. Stronger body practitioners can imagine their arms pressing on a wooden balustrade, free from any burden, or imagine that they are swimming with hands on the water, receiving back its buoyancy force and preserving this





impression of effortlessness. In fact after a certain level in ZZ practice, you really have this kind of comfortable feeling called “loosening limbs feeling”.

#### *V.2.4 Steeping on cotton activity*

**Steeping on cotton activity** induces further relaxation in lower limbs’ muscle relax suppressing unnecessary stiffness. Assuming ZZ, imagine that feet are stepping on a soft and thick cotton mat, move slightly body leftward and rightward every 3-5 minutes, or use toes slightly grasp ground several times which is using adjustment of weight placed onto sole, experience in lower limbs all muscles relaxing/contracting and any abnormal stiffness which may affect your abdomen muscles.

#### *V.2.4 Holding ball activity*

**Holding ball activity** is training upper limbs’ extremities nerves to enhance gradually their responsiveness. For example, you can imagine that both hands are holding a balloon filled with air, do not use force when lifting the balloon. Avoid using too much force as to prevent it from blasting away, just use suitable force. In a later step you can imagine that both hands are holding a big rubber ball or big watermelon, its weight gradually increasing which is in accordance with the quantity of physical strain that you can exert during your exercise.

#### *V.2.5 Wading in water activity*

**Wading in water activity** trains nerves of lower limbs’ extremities and enhance gradually their responsiveness. For example, assuming post standing imagine that you are standing in comfortable and warm water which is slowly flowing water in your direction, or that you are like walking in water and feeling its resistance. The water level should be adjusted according to the physical strain you want to induce in your exercise; in any case it should not exceed chest level. In a further training you can imagine walking in the mud, as to imagine a larger resistance than in water. All these examples of activity will gradually increase lower limbs amount of physical strain.



## V.3 Pure contraction/relaxation (PCR) activity

In common physical exercise or athletic sport working muscles are just involved in a bending-stretching activity required in their movements which characterizes the First Kinetics of physical exercise, but have resting muscles contracting/relaxing as required in the First Kinetics of physical exercise.

*Song* is the Chinese character referring to muscle relaxation, *Jin* is the one for muscle contraction. *Song/Jin* happen when we are consciously ordering resting muscles to execute their contraction/relaxation cycles: this is in fact the training of higher mental functions in relation with the Central Nerve system that what Second Kinetics of P.E. is about.

Second Kinetics of P.E. is the only way tested and validated over thousand of years from Ancient China to train and reinforce the higher mental functions. This training should progressively lead you to a fully refreshed, bright and concentrated mind.

Contraction/relaxation activity is a primary form of mental mind activity in ZZ. From the situation where all joints are maintaining their bending angle, you are in the best way to train more systematically each group of muscles. Later once you've built a solid basis, you can start “pull tightly tendon” activity, “pulling and hanging” activity, which are, although also other kinds of contraction/relaxation activity, but this time they are combining your whole body muscles into a unified contraction/relaxation process, like merging them into a unique muscle group training.

This kind of training is clearly more difficult than training of local muscles in contraction/relaxation activity, because we are concerned by internal “muscles dynamics” such contraction/relaxation amplitudes are smaller and smaller as you progress in your training.

These unified contraction/relaxation exercises are only accessible in intermediate and advance level of Dachengquan.

### V.3.1 PCR experimentation

PCR experimentation refers to experiment by yourself the Second Kinetics of Physical exercise.

Experimentation implies to reach a clear distinction between First



Kinetics and Second Kinetics, the constant validation of resting muscles contraction abilities. For this purpose we will present below four types of experimentation:

#### V.3.1.1 Shank muscle experimentation

Assuming sitting posture, the soles of both feet placed horizontally on the ground, you should have thigh with shank forming 90 degrees angle, during this time leg muscles are not involved in any strain, they should be soft and relaxed as in the complete opposite situation of ZZ where local muscles were contracting and stiff.

Sole and heel should not leave ground, knee should not moving upward and downward, just control mentally the shank muscles and order them to execute their one-contraction/one relaxation cycle. You should control accurately contraction frequency in three different PCR speed: fast, slow and sustained.

You can palpate your muscles and feel how soft it is during relaxation and how hard it is during contraction.

As you are sitting on a chair, sole touching ground, heels leaving ground, shank is executing an upward/downward oscillation which is the simplest and lightest way to experiment PCR cycle (first Kinetics PE) where besides the external oscillation no real contraction is palpable or observable.

Now sole and heel are touching ground and should not leave ground, just use mental control to have shank muscle to execute PCR cycle but this time without any oscillation while staying being immovable. If you perform it well you can feel by touching your muscles in a stronger and more distinct contraction which is also observable by experienced practitioners: this is the expression of Second Kinetics PE).

Using mental control to get resting muscles contracting is an active and conscious activity in its highest degree. In the beginning it will be quite difficult to execute it correctly, as muscle doesn't answer to your mental order and it may seem impossible to use locally power. This shows you in fact the lack of mental/body harmony which almost anyone, without proper training, can expect. By persisting in daily practice, from series of



ten or even hundred (until you are tired) during each session, you will reach a level where you can practice any series very easily and very freely.

Let's see now different of types of contraction/relaxation experimentation.

#### V.3.1.2 Thigh muscle contraction/relaxation experimentation

Assume same posture as before. Place both palms on thighs, use mental control to execute thighs one-contraction/one-relaxation series. During this series you can use your hands to touch quadriceps and feel by yourself their contraction.

#### V.3.1.3 Buttock muscle contraction/relaxation experimentation

Assume the same posture as previously. Place both hands on the two sides of buttock, use mental control to execute with buttock muscle series of one contraction/one relaxation.

When you are contracting your buttock muscle, upper body can slightly raise, when relaxing it upper body can slightly descend. Both hands touching buttocks muscle to feel the change from hardness to softness during contraction/relaxation.

#### V.3.1.4 Combined contraction experimentation

Assume the same posture. Use mental control to combine calf and thigh muscles in a same and simultaneous contraction series.

Later you can even combine calf, thigh and buttock muscles for a combined contraction series. As you will experiment by yourself, the more muscles you are combining, the more difficult it is to contract them simultaneously.

In the beginning as you are just starting to combine them, you will notice some difficulties to perform it correctly, contractions are not perfect. You may have calf muscle contraction but no thigh muscle contraction or buttock muscle contraction but no calf muscle contraction; left leg muscle contraction but no right leg muscle contraction or one contracting before the other...

After sufficient training, they will be able to contract simultaneously, at will: you've reached a higher mental/body harmony.

During Zhan zhuang, we can classify different levels of contraction/relaxation training though their



anatomical/physiological implications requested and their increasing difficulties:

- 1. Maintain a determined posture and train bending muscles,**
- 2. Train contraction/relaxation and train stretching muscles,**
- 3. Train combined (larger number of muscle groups) and train nerves,**
- 4. Pull (tendon) and train tendons,**
- 5. Pull/hang and train spirit.**

Level 1 belongs to the First Kinetics of physical exercise, Levels 2, 3, 4 and 5 belong to the Second Kinetics of physical exercise and will be further discussed in this book.

### **More about the contraction/relaxation activity**

Studying Zhang zhuang is the first step in acquiring a whole body bursting power, you should first understand separately each important part of the body involved in the whole process.

In the beginning you should just focus on contraction/relaxation of some parts of the body, this will help you to understand contraction/relaxation process locally and gradually you will understand how to reach a whole body contraction/relaxation.

Reaching a whole body interconnected requires you to work out separately and in “finesse” each part of this entity.

The general idea in Dachengquan training is to build up an powerful and unified body/mind entity as you would do for high buildings, starting *bottom/up*, from lower limbs and gradually upper levels. When you are starting a higher level exercise you will experiment new sensations in the exercise itself, the nature of this exercise having evolved as well the principle to be applied.

Basic principles of Contraction/relaxation activity:

1. Train one leg: In the beginning, start to focus your attention to just one leg, concentrated on how some local muscles are applying contraction/relaxation. For example: with the calf muscles,
2. Train two legs: alternating contraction/relaxation between them,
3. Train two legs: contraction/relaxation simultaneously,



4. Train also upper limbs: first with one hand in contraction/relaxation,
5. Train with two hands: alternate hands in contraction/relaxation,
6. Train with two hands: use simultaneously both hands in contraction/relaxation,
7. Train with waist, abdomen and hips as axes, first with one leg/one hand combined during contraction/relaxation,
8. Train with waist, abdomen and hips as axes, two legs/two hands combined, proceed with a same direction and later with opposite during contraction/relaxation.

*Basic concepts of partial contraction/relaxation:*

During Zhan zhuang, contraction of partial/local muscles should respect the following concepts:

1. Upper part relaxed then lower part contracted;
2. Root relaxed & extremities contracted;
3. Shoulder relaxed & leg contracted;
4. Arm relaxed & leg contracted;
5. Chest relaxed & belly contracted;
6. Back relaxed & hip contracted;
7. Form relaxed & mind contracted.

Compared to conventional physical training these previous concepts may appear completely opposite. As in conventional training, upper level is contracted and lower level loose, root contracted& extremities relaxed, shoulder contracted & buttock relaxed, arm contracted then leg relaxed, chest contracted then belly relaxed, back contracted then hip relaxed, form contracted then mind relaxed etc...

Therefore during post standing you should scrupulously check up all local muscles contraction/relaxation.

Let me suggest you the following method:

(1)Upper level relaxed & lower level contracted during contraction/relaxation activity

Here upper level refers to shoulder but also arm, chest and back etc...Lower level refers to hip, foot, calf, thigh, buttock, belly and waist etc...

**Comments on Upper level relaxation & lower level contracted during contraction/relaxation activity**



- One aspect concerns the fact that upper level nerves are easily overstimulated during ZZ which induces stiffness, therefore one's should learn to relax them and reduce to minimal contraction required.

- Another aspect is that lower limbs should be in "contraction" to strengthen and enable them to exert sufficient power. This is when lower part of body: foot, calf, thigh, buttock, belly and waist etc...resting muscles are in contraction/relaxation activity while upper part of body: shoulder, arm, chest and back muscle should be keeping relaxed, not stiffening, thorax breathing muscle not overstimulated to avoid suffocation and oxygen depth.

This subtle combination upper relaxed/lower contracted makes this body's internal state particularly difficult to achieve compared with some parts of body contracting/relaxing.

Again this cannot be achieved in a few weeks of training, this is the reason why we should go progressively.

In the beginning your body has no internal harmony, for example in contracting one part you may forget to relax another part, you do not perceive the necessary contradictory states required in the body.

Here is an example of progressive exercises:

#### 1. Calf muscle contraction/relaxation activity

Assuming post standing, upper limbs keep complete relaxed, contract once consciously and actively calf resting muscle and keep it relaxed for a certain time, after proceed again contraction.

You can repeat with one fast, slow or lasting contraction—then relaxation—again same type of contraction—again relaxation...

In the beginning you can only practice a few times or slightly more with ten times, but gradually you'll be able to increase up to hundred, and even several hundred times before being tired.

#### 2. Thigh muscle contraction/ relaxation activity

Assuming post standing, upper limbs keep relaxed, thigh resting muscles are consciously contracting once, after relax during a certain time, and then proceed again to contraction until you are getting tired.

#### 3. Buttock muscle contraction/relaxation activity

Assuming post standing, shoulder and back muscles keep relaxed, contract consciously buttock muscles once and after relax during a





certain time, then proceed again to contraction until you are getting tired.

(2) “Roots” relaxed–“extremities” contracted in contraction/relaxation activity

“Roots” here refer to upper limbs’ root: shoulder, arm, chest and back etc...

“Extremities” refers to hand, wrist, palm and finger etc...

So “roots” relaxed - “extremities” contracted can also expressed by shoulder relaxed and hand contracted.

Other requirements of such specific training are: shoulder relaxed & hand contracted; arm relaxed & wrist contracted; chest relaxed & palm contracted; back relaxed & finger contracted.

Assuming ZZ, contract consciously hand resting muscle once and after relax during a certain time, then proceed again to contraction while you are maintaining your shoulder relaxed whatever hand is performing.

When upper limbs’ extremities i.e. hand, wrist, palm and fingers muscles are contracting “roots” should be relaxed that means that shoulder and neck muscles should only exert a minimum supportive power for the posture itself but avoid exerting too much stiffness.

Otherwise without any appropriate training, you will easily fall into the situation where when “extremities” such as hand is using force, that “roots” such as shoulder will naturally multiply exerted power, causing shoulder and thorax muscles excessively excited, affecting breathing and cardiac muscles.

Form “roots” relaxed and “extremities” contracted training you will built up solid foundation for issuing force techniques and sparring abilities.

(3) Same direction and opposite direction in contraction/relaxation activity

**Same direction and opposite direction in contraction/relaxation activity** refers to the interaction between two legs, between two hands, between one leg and both hands, between both legs and both hands, exerting force in the same direction or opposite direction during contraction and relaxation activity.

You have for example:

- 1) Both legs exert force forward in the same time.
- 2) Both legs exert force backward in the same time.



- 3) One leg exerts force forward, other leg exerts force backward.
- 4) Foot use exerts downward, calf exerts force upward.
- 5) Front leg exerts force downward, back leg exerts force upward.
- 6) Foot use force downward, calf use force backward, thigh use force forward, buttock use forward inward.
- 7) Thumb exerts force upward, little finger exerts force downward, index, third and fourth finger exert force forward.
- 8) Both hands exert force forward in the same time.
- 9) Both hands exert force backward in the same time.
- 10) One hand exerts force forward, other hand exerts force backward.
- 11) One hand exerts force upward, other hand exerts force downward.
- 12) Hands exert force forward, both exert force backward.
- 13) Hand exert force backward, body exert force forward.
- 14) Both legs exert force forward, both hands also exert force forward.
- 15) Both legs exert force backward, both hands exert force forward.
- 16) Both legs exert force forward, both hands exert force backward.
- 17) Both legs exert force upward, both hands exert force downward.
- 18) Both legs exert force downward, both hands exert force upward.
- 19) Hand and foot of one side of body exert force forward, hand and foot of other side exert force backward.
- 20) Foot exerts force downward (toes), head exerts force upward (top of head). Leg exerts force upward (pulling leg), shoulder exerts force downward (shoulder descends). Knee exerts force outward (knee support), buttock exerts force inward (buttock changed tighten). Belly exerts force backward (belly withdrawing), elbow exerts force outward (elbow placed horizontally). Hand exerts force forward (fingers), body exerts force backward (body leaning).



## V.4 Combination activity

Combination activity is an intermediate level form of mental activity for contraction/relaxation activity. It involves local parts of the body, with one joint as the axis and two bones as leverages, in combined movement of resting muscles during contraction/relaxation. In fact it adds two parts of the body muscles to join this contraction/relaxation activity.

Combination activity should start with two points combined, for example as calf combined with thigh, then gradually increasing to three points combination, for example calf, thigh and buttock, then you continue to again increase gradually to four points combination... Each time you are increasing number of combination, each time you are adding one “pulling tendon” sensation or “Pulling-Hanging” sensation, etc... which a new form of internal exercise, new internal sensation, increasing the overall “quality” of physical exercise. Here are some training methods:

4.1 With ankle joint as axis, from heel to toe as opposite side, heel to knee as adjacent side, knee to toe as hypotenuse, all sides forming a right-angle triangle. Sole and calf resting muscles are combining during one contraction/one relaxation exercise. Triangle defined by points 1, 2, 3 in Figure 5-1.

4.2 With knee joint as axis, from knee to hip as opposite side. Here with sole as supportive point, calf and thigh resting muscles are combining during one contraction/one relaxation exercise. Triangle defined by points 1, 3, 4 in Figure 5-1.

4.3 With hip joint as axis. Here you more combination: belly, buttock and thigh resting muscles are



**Figure 5-1**



combining during one contraction/one relaxation exercise. Form defined by points 3, 4, 5,6 in Figure 5-1 and 1, 2, 3, 4, 5, 6 in figure 5-1.

4.4 With elbow joint as axis, elbow to shoulder as opposite side, elbow to hand as right-angle line, shoulder to hand as hypotenuse: forming a right-angle triangle. Here arm and forearm resting muscles are combining during one contraction/one relaxation exercise.

4.5 With third metacarpus as axis, thumb and little finger combining and expanding, their fingertip grasping inward. Second, Third and Fourth fingertip stretching forward, palm facing in, wrist hooking downward, shoulder muscle should relax.



## V.5 Stretching tendons activity

Stretching tendon activity is a high level form of mental activity during contraction/relaxation exercise. It involves more than two limbs while combining resting muscles in a single stretching, tendons are like elastics which two extremities are using force in the same time or one extremity fixed and the other using force, then suddenly exert a pulling tightly contraction/relaxation movement. All limbs and resting muscles are unified to create an homogeneous entity, while maintaining angle in knee joint, hip joint, shoulder joint and elbow joint, your whole body may stretch upward, downward, leftward and rightward, always inducing in a general direction of stretching and in the same time in the opposite direction, one contraction/one relaxation or one stretching/one contraction in a jiggling activity, in 《Huangdi Nei Jing》 - the fundamental TCM treatise, this was called “One muscles unified as one” physical exercise.

As we indicated in the beginning of this paragraph, Stretching tendons activity is comparatively more sophisticated high level form in contraction/relaxation activity. In fact this high level form should still include lower level forms such as Pure contraction/relaxation activity and Combination activity discussed earlier.

Now we are following the general method of training the unified and bursting issuing force ability, starting from controlling/using local resting muscles up to much complex group of resting muscles combination and even up to a whole body resting muscles.

From a quantitative training you are evolving into a qualitative training and after another quantitative training but each time increasing the level of complexity in internal movements and also in the internal power involved in your exercise, being each time closer to a perfect issuing/bursting power.

Let's present now the different methods of Stretching tendons activity:

V.5.1 Assuming the Third form of Basic standing posts: **Third form: Chest vertical – hands supporting and embracing.** Now your most important triangle for stretching forces is defined as followed:

Distance between both feet as the Base and the Summit localized in the waist. Both legs resting muscles are already linked (basic level ability), now think this link as an elastic tendon, suddenly pulling/stretching it once forcibly, exerting one contraction/one



relaxation, one stretching/one contracting as Stretching tendons activity.

V.5.2 Assuming the previous posture. Here are multiple triangles of stretching forces defined as followed:

Distance between both feet as the common Base, Summits localized in neck, sole, calf, thigh, buttock, waist, belly, back, neck, nape (back of the neck), etc... After gathering your resting muscles into a basic combination, think the link foot-neck as elastic tendon, suddenly pulling/stretching it once forcibly, exerting one contraction/one relaxation, one stretching/one contracting as a stretching tendon activity.

V.5.3 Standing in T-eight post. Triangles of stretching forces are localized in the upper body:

Distance between both hands as the common Base, Summits localized in hand, arm, neck, shoulder, back etc...After gathering your resting muscles into a basic combination, think the link hand-neck as elastic tendon, suddenly pulling/stretching it once forcibly, exerting one contraction/one relaxation, one stretching/one contracting as a stretching tendon activity.

V.5.4 Standing in T-eight post. Triangles of stretching forces are localized as followed:

First triangle: Distance between both feet as the Base, Summit localized in waist.

Second triangle: Distance between both hands as the Base, Summit localized in waist.

Third triangle and Fourth triangle: two hand-neck-waist triangles.

Use waist and belly as axes, all up-down, left-right, front-back triangles area of resting muscled interconnected as a single muscle, suddenly pulling/stretching it once forcibly, exerting one contraction/one relaxation, one stretching/one contracting as a stretching tendon activity and in the same time in the opposite direction another stretching tendon activity.



## V.6 Linking activity

Linking activity is even a higher level form of mental activity during contraction/relaxation exercise than the previous ones. It requires all parts of whole body resting muscles to interconnect as learnt in previous level, but now they are required to behave a unique entity, freely stretching tendon, mentally enlarging the internal amplitude, extending force, as interconnecting to **some external objects** in front of your body.

Now it is precisely this link between your body and some external objects which should be contracting than relaxing after contracting again, and so on...continuously alternating without exaggeration (to avoid oxygen debt) contraction/relaxation, combination, stretching tendon and linking activities. I repeat again “without exaggeration” to strictly avoid suffocation. This is extremely important to strengthen your imagination and to prepare your mental for combat.

Even more crucial than previous level, you should have perfectly master all previous levels of mental activity: Pure contraction/relaxation, Combination activity, Stretching tendon activity before practicing Linking activity otherwise you will not be able to reach this refined level of excitation in your mental which is absolutely necessary to succeed in linking activity.

Let me present you now the training method of **Linking activity**:

Assume your post, standing in front of a tree or a wall, imagine that it is your opponent, your mind is enlarging, force extending, the extremity of your index (or hand) is like connecting to this external object, linking and combining with it: that means that you are pulling the tree here, and after pushing it back.

You should be like able to issue force as “penetrating your opponent’s back while harming him externally there”. During this time “roots” of upper limbs, i.e. shoulder’s muscles should relax but extremities of hand and finger should be “contracting”.

At a further step of practice you can use your neck into linking and combination activities with external objects.

After this step you can imagine at a distance between 1 to 3 meters, being like far but in the same time quite close some dangerous predators, such as viper or beast of prey or in front of powerful and huge opponent, you are striving for survival this is called “Facing opponent inducement” training, and is among the highest level of mental activity in ZZ exercise.





Here are the specific requests:

Local parts of body request:

*Sole stepping onto the ground,  
heel slightly lifted,  
sole like a spring,  
avoid ankle from shaking otherwise body will quiver.*

*Both knees expanding,  
buttock tight and leg twisted,  
anus and belly (retracted as in) inspiration,  
hip twisting and crotch wrapping.*

*Back and waist keep vertical,  
chest slightly withdrawn,  
shoulder expanding and elbow horizontal,  
wrist hooking and finger pointing.*

*Head and neck all erecting,  
mouth open and jaws withdrawn,  
hair like pointing up,  
teeth like chewing.*

Whole body request:

*Whole body swelling,  
force rushing to a distant place,  
linking with all-around,  
each hair pointing as a halberd.  
Form is bending then force is straight,  
Form relaxing then mental should keep contracting,  
Relaxing but not slacking off,  
Contracting but not stiffening.*

Mental request:

*Spirit of raging tiger,  
Mental of evasive snake.*

Spiritual verve:

*As a rooster in combat, spreading wings.  
As a fish fighting meeting its opponent, turning its gill and erecting.  
As a winning cricket relaxing wings, grasping claws and shaking  
body.*



*As a wild horse galloping, its body burnt by a raging fire.  
As a cyclone blowing off trees, raising them from ground and then  
them spreading out.*

*Under the slightest touch, bursting immediately, explosive power  
undisrupted from combat posture.*

Regarding these requests, it is evident that in the beginning it is impossible to fulfill all of them, even one of them. This can't also be achieved within a short time, all these very particular requests require just consequent practice.

In your training, you should first from immobility, experience all parts of whole body muscle in contraction and relaxation estate, linking with external objects and appreciating the relevancy of interconnection between body and these objects.

Sensing with “finesse” up/down/left/right, inside/outside/front/back, mutually interlinking each other, mutually leaning on each other, restrict with each other, regrouping/dispersing, local/unified, internal/external.

In the further step it is again from *jiggling* you will realize from motion to immobility, from immobility to motion, when moving you are like non-moving, when non-moving you are like moving.

When moving it should be without discontinuity, when non-moving internal forces should be symmetrical, when non-moving don't be reductive, when jiggling you should prolong link/exchange with external object. Seeking the cause of your move, and not seeking the effect of your move, tranquility inside your move, movement inside your tranquility, you have simultaneously hard/soft, false/real and contraction/relaxation all integrated.

Zhan Zhuang is the way to reach from non-moving fast moving, from clumsiness agility, from tranquility power, from common uncommon, with forms its root, and it is a training method using extensively your mental.

Quantity of physical strain in ZZ should be developed through following axes:

- from beginner level to high level,
- from local parts to whole body,
- from internal of body to external of body,
- from quantitative change to qualitative change,
- from shallow to deep, gradually developing,
- follow in order and advance step by step.

Post standing allows you to practice muscles, strengthen your physique, train nerves, develop high mental functions, transform physiological



functions and elevate your spirit.

The way of post standing is constantly improve your technical abilities, invigorating your interest and releasing constantly its unexpected charm, combination of physical and mental practice: it the way to develop body/mind without any limit.



## V.7 Sole contraction/relaxation activity

In Dachengquan Zhan zhuang exercise, although all postures are required to be maintained without any displacement, it is the bending angle of four limbs which change from one posture to another.

For example: when we are normally standing, knee angle is 180 degrees. But when we train post standing knee should bend around 150-170 degrees or smaller. Then by maintaining your Zhan zhuang posture, you are requesting the corresponding working muscles to contract, preventing your body to change to any other posture. I call this type of physical exercise a *passive* physical exercise. Beside this type we have also the *proactive* physical exercise.

Let's start with the first type.

### *V.7.1 Passive physical exercise*

Assume a posture, during your standing working muscles are constantly contracting to maintain your posture.

After 10-20 minutes, your hand can feel or you can visually check that thigh muscles are constantly contracting/relaxing in a very high frequency. This is a particularity of Zhan zhuang compared to any other physical exercise. Temperature around knee cap can increase up to 4-5 degrees compared with other areas of the body, pulse rate may accelerate up to 90-150 Bpm a few minutes.

The next step you may observe is whole body warming up and sweating accompanied by a relaxed, comfortable and well-being feeling.

In a word, by maintaining your posture working muscles are resisting to weight and inertia your body. This is a First Kinetics of Physical exercise.

### *V.7.2 Proactive physical exercise*

Proactive physical exercise is Dachengquan's particular training method of resting muscles brought into the Second Kinetics of Physical exercise.

From your Zhan zhuang posture, besides just training your working muscles as in *Passive physical exercise*, you can train the other muscles which were "resting" in normal standing: the resting muscles. In this case using mental activity is in fact using the conscious brain function to command just resting muscles to participate to this collective contracting exercise, as a result your pulse is increasing,



you are performing a *Proactive physical exercise* with full conscious and freedom.

#### V.7.2.1 Sole function – Guo's story

In *Proactive physical exercise*, feet are the most difficult training parts. The skin of the sole of the foot is thick and hairless with abundant sweat glands. It is firmly bound down to the underlying deep fascia by numerous fibrous bands. It shows few flexor creases at the sites of skin movement. The subcutaneous tissue contains a lot of fat, especially the heel.

The function of the plantar aponeurosis (deep fascia) is to give a firm attachment to the overlying skin, to protect the underlying vessels, nerves and tendons and their synovial sheaths, and to assist in maintaining the arches of the foot.

Sole & foot provide us also the ability to can stand steadily on any rugged and non uniform type of ground. The internal side of the foot can reduce significantly shock transmitted from the ground, absorbing vibrations conducted up to the internal body, especially shake the brain while it should satisfy its elastic abilities in strain demanding such walking, running and jumping etc...

In the sole we find short muscles and long tendons: this helps to keep internal side of the foot its supportive power. These ligaments although very resistant and firm, but they are lacking of *proactive* contraction function. As we presented in the *IV.1.2 Brain mapping for Upper limbs/Lower limbs*: areas dedicated to lower limbs in the Primary Motor cortex and Primary Somatosensory cortex as much smaller than upper limbs ones as a result their command/control are naturally less developed then for upper limbs.

In the sole, ligaments are small but able to bear the weight of whole body and participating actively to the functions of standing and balance of the body. Although it amplitudes of contraction/relaxation are relatively small, but they are able to shake the whole body, using an amazing power that may shake “Heaven” and “Earth”.

Sole contraction/relaxation training is specially involving training sole's tendons into a proactive contraction/relaxation activity: the special “moving sole” method.

I remember what Wang Xiangzhai told me about his own master Guo Yunshen: “One day Mr. Guo Yunshen, looking for a new pair of shoes, wanted to joke and said to the shopkeeper: “These shoes are not resistant.” Then the shopkeeper said: “these shoes have



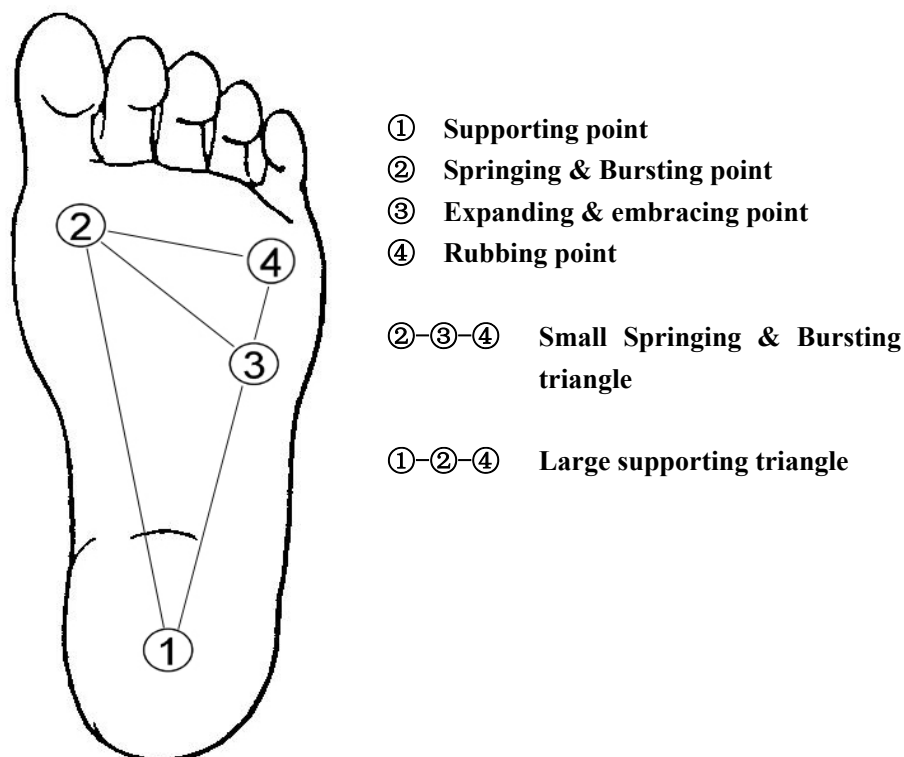
internal and external coating made with new material, extremely resistant.” Mr. Guo said: “these shoes will break under a single stress.” The shopkeeper said: “You can try to tear them out. I will not charge you anything.” Mr. Guo slipped his foot into the shoe, suddenly used force: the new shoe broke immediately. The shopkeeper was absolutely astonished, later this story spread out widely.

In fact this anecdote underlined the extraordinary bursting power of Guo’s sole.

#### V.7.2.2 Moving within immobility: sole movement

When we are standing and not moving, use resting muscles involved running, jumping, kicking, pedaling, etc... to proceed on contraction/relaxation activity, the resulting physical exercise is differing completely from the conventional bending/stretching limbs movements, it requires a high degree of mental concentration from the practitioner, in each contraction/relaxation cycle your brain needs to stimulate consciously and command nerves and tendons of sole to get them proceed on the desired action.

#### Contact points of sole – Small and Large triangles



**Figure 5-2**



In this time heel slightly lifted, sole touching ground and should not leave ground, reducing your heel *Supporting point* (point ① of Figure 5-2), mobilizing your total weight, enforcing your *Springing and Bursting point* (point ② of Figure 5-2), stamping ground and bursting with power.

Once you get proficient with the previous exercise you can gradually link to the whole body: every limb, every part of the body, pulling off local bone into contraction/relaxation, combining upward/downward, muscles and internal body as one, unified body into contraction/relaxation activity, ready to burst immediately under the slightest touch, able to burst and issue interruptedly force according to the Second kinetics of physical exercise.

We can say that in general buttock and thigh muscles are relatively more skillful in contraction/relaxation activity than calf ones are. Sole's Contraction/relaxation of sole is far the most difficult to perform. So, when you are practicing Zhan zhuang you should specially bear this in mind, which is paying a special undisrupted attention to foot/sole nerves & ligaments.

After sufficient training, you may overcome this natural weakness, able to use its local power at will first then progressively it will ally bottom up with every part of the body as a unified entity performing a unique task.

### V.7.2.3 Contraction and relaxation activity of sole

#### V.7.2.3.1 Running activity

Running activity develops the abilities of both feet to stamp ground backward and downward forcibly. You should look for the causes embedded in this movement and not the effects then prepare them as for running.

In common running, as a preparative step your sole is first touching ground, and then uplift foot to get off the mark.

So we can define stamping ground as the cause, uplifting foot as the effect.

In fact in Zhan zhuang we are looking principally for the cause of this movement and not the effect.

Applied in our ZZ training, as we are maintaining our position, and we want to check principally the cause (of the running movement) and not the effects, then we are especially focusing on “Stamping the ground” and not “uplifting the





foot”.

This is why in the contraction/relaxation activity during stamping the ground; the sole should not leave the ground.

This last point is a very characteristic of Dachengquan compared with other methods of physical training.

In healing standing post, both feet shoulderwidth apart, heel slightly lifted above the ground, but not exaggeratedly.

Sole is touching ground, place total weight onto the sole. Knee joint should not move upward and downward, not waving leftward or rightward. Upper and lower part of the body maintaining its former position and not moving, imagine that you are running, sole uses stamping ground instantaneous movement in contraction/relaxation. But again sole should not leave ground. When left foot is stamping ground, right foot is resting, when right foot is stamping ground, left foot is resting. Alternate left side-right side or contract both sides simultaneously, until sole and calf muscles are tired.

Experience carefully this running exercise without really running, get your resting muscles into contraction/relaxation. In the beginning your sole will not literally “obey” to your brain’s command, sometimes unable to use force, sometimes the simultaneous contraction/relaxation of two sides is not achieved, it is only through diligent daily training that you can reach this skill and use it at will.

#### V.7.2.3.2 Jumping activity

Jumping activity develops the ability of both soles in using force for stamping and bouncing up from the ground, during contraction/relaxation activity, in the condition that you are not really jumping.

Assume your Healing standing post, both feet shoulder apart, about shoulder width. Imagine that you are preparing to jump, sole stamping ground forcibly, at the moment whole body is ready to jumping up, sole and calf muscles use force to stamp downward triggering a contraction/relaxation cycle.

Here again you are only interested in the cause of the jumping movement and not the effect. That means that sole is stamping ground downward forcibly, heel not leaving ground, try your best to stay in your former position without moving.

Repeat this imaginary jumping contraction/relaxation activity, but do not really jump.

In your exercise you should alternate left side/right side or



practice both sides simultaneously. Increase gradually the intensity of power requested in your exercises.

When you are using force to stamp ground, avoid knee joint from moving up and down, you should have only sole and calf resting muscles actively contracting/relaxing, your body should not have any falling, waving and moving upward/downward movement.

#### V.7.2.3.3 Expanding-embracing activity

Expanding-embracing activity develops sole's nerves and muscles power for expanding leftward/rightward and supinating (twisting outward) through contraction/relaxation activity.

Assume your healing standing post, both feet shoulder width apart, both knees slightly bent, sole touching ground, heel slightly lifted, try your best keep feet parallel (Figure 5-3).

Both soles *Springing and bursting points* ②, stretching and supinating (twisting outward), during this time knees should keep their original posture avoiding to twist inward.

In the opposite, both soles *Embracing points* ③ with *Rubbing points* ④ are simultaneously using force to reassemble back, both knees in the same time slightly pointing outward, calf and thigh muscles stretching up, buttock muscle should pronate and stretch in the same time, pay attention to avoid blocking your respiration.

#### Expanding/embracing sole movement

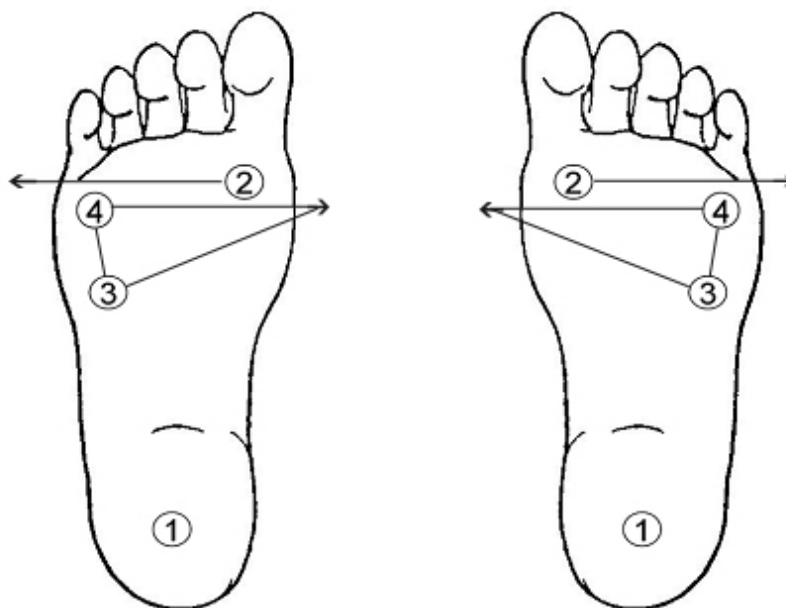


Figure 5-3



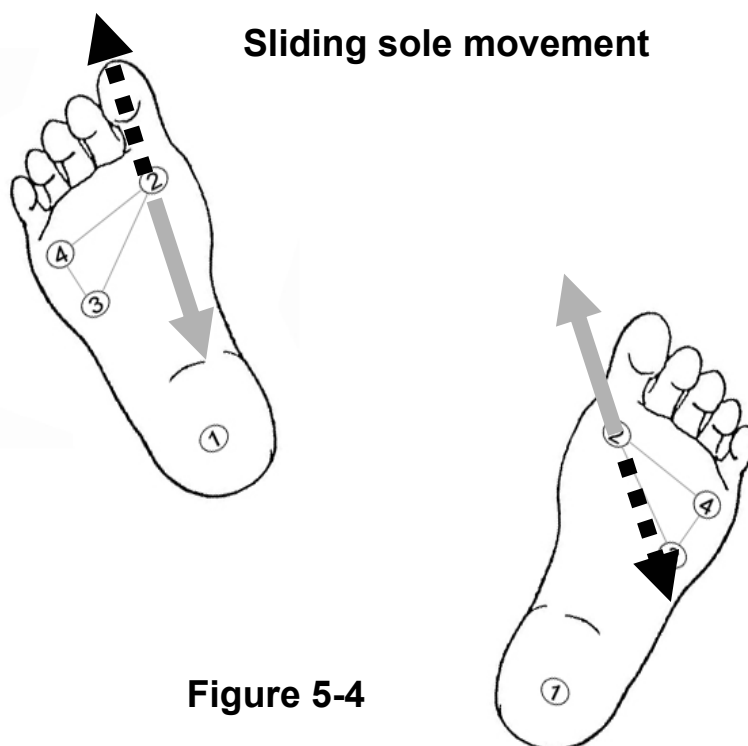
Repeat sole expanding/supinating (outward), embracing/pronating (inward) contraction and relaxation activity until getting tired.

Displacement of sole during expanding/embracing activity should be with 2-5 mm.

#### V.7.2.3.4 Sliding activity

Sliding activity develops sole muscle sliding power on ground forward/backward during contraction and relaxation activity.

Standing in T-eight post with one front foot and one rear foot. Both heel slightly lifted, do not touch ground. Front knee slightly stretching forward, both calves stretched and contracting, total weight is distributed 40% front leg and 60% rear leg. Use mental command to get front sole slightly sliding forward forcibly once, in the same time rear sole uses force to slide slightly once backward. On the contrary, front sole uses force to slide backward, rear sole uses force slide forward. Front and back foot moving in opposite directions, repeat this exercise until you'll get tired. (Figure 5-4)



**Figure 5-4**

Sole sliding range should be about 2-5 mm.

Once you'll be proficient in sole sliding forward/backward,



you can complete it with mental activity of steel filing iron resistance feeling.

#### 7.2.3.5 Trampling and rubbing activity

Trampling activity develops trampling power of leg and foot oriented down to sole and onto ground.

Rubbing forward/backward activity is in fact to perform a rubbing forward and backward cycle with sole on the surface of the ground.

Assume T-eight post, with one fore foot and one rear foot, both heels slightly lifted and not touching ground. Front knee slightly pointing forward, both legs calf and thigh muscles should be stretching and pronating (twisting inward).

Once your posture is adjusted, use mind to order rear sole to trample ground once and in the same time fore sole to rub forward ground once.

Now the opposite movement, when fore sole is rubbing backward ground rear sole should be trampling ground while thigh and calf are lifting and like holding something.

Now repeat the whole process: rear foot stamping, fore foot rubbing forward, then the same foot rubbing backward while rear foot is trampling, thigh and calf lifting/holding... consciously monitoring all required muscles contracting and relaxing.

You will increase gradually the intensity of contraction, when you become proficient, you can add upper limbs then whole body participating simultaneously to this overall contraction/relaxation activity.

#### 7.2.3.6 Pulling/separating activity

Pulling activity refers to a very high level exercise where you are like peeling off bone from its surrounding tendons and muscles. For neophytes it is almost impossible to understand what is really happening during this exercise but with some significant progress in Dachengquan, you will progressively feel in your movement for example in Testing force, the ability to separate bone from its tendons/muscles.

Here you will use this ability as complementary to the sole activity.

First your sole can freely contract as starting running, jumping,



kicking, treading, supporting, pronating, sliding and filing etc... all these types of physical activities but in the same time holding the same posture, tendons and ligaments of both soles are combining with calf and thigh muscle, and are forming now a pair of “elastics” peeling off from bones, that means each leg down to sole, is performing a very high exercise of stretching/pulling tendons/muscles so that bones are like separating from them

Standing in T-eight post, using sole's small triangle area as the fulcrum, combining from calf, thigh, buttock up to waist, using belly as axes, combining again from chest, back, shoulder and neck, linked to elbow and hand as tied with a pair of elastics, using waist, belly and hips as axes, use brain to monitor, to command, to select pulling orientation: up-down, left-right, front-back direction and its opposite direction involving your whole body in pulling, kicking and rubbing, expanding and pronating, joining this overall contraction/relaxation, as well as all previous forms of contraction/relaxation activities (stretching tendons, combination etc...).

When you reach this very high level where bone is like separating with muscles, all muscles are unified and contracting as a single muscle: it is the highest expression of stretching tendons contraction/relaxation activity.

At that time the stretching power you are able to generate in pulling, kicking and rubbing, gives this ultimate physical/mental expression in your standing as like trampling the whole planet and supporting the sky.



## Mnemonic poem

*In Zhan zhuang nothing but your sole movement,  
Upward, downward, leftward, rightward, forward and  
backward movement.  
Rapidly, slowly and perduring movement.  
Running, jumping, trampling, rubbing, contraction  
relaxation movement.  
Expanding, pronating, sliding, filing and peeling off bone  
movement,  
Hand and foot are combining in stretching tendons  
movement,  
Pulling powerfully as body unified movement,  
Amazing springs, hooking pulling: mental kinetics move*